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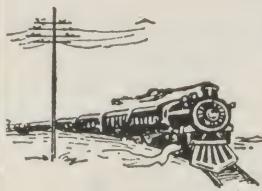
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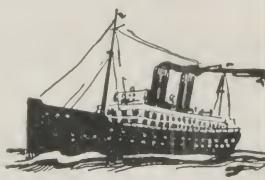
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THE CANADIAN ILLUSTRATED MONTHLY



Vol. VI.

MONTREAL, JANUARY, 1922

No. 11

Our Chat With You

IN wishing our readers the compliments of the season, and re-echoing with all our heart the universal hope that the year we have just entered on will be one of peace and prosperity to all the earth, we cannot refrain from reiterating our statement of a few weeks ago that the measure of progress and prosperity that will be Canada's lot in 1922 will be predicated very largely on the national state of mind.

Conditions in Canada have not been too roseate of late, but we must remember that conditions have been bad throughout the world, and that in comparison with other countries, the Dominion has fared well indeed. Now, however, the worst seems to have past, and indications for a revival of industry everywhere are extremely good. There is no

reason to doubt the future of Canada, and while over optimism, as it is sometimes called, is to be guarded against, so also is pessimism, which is the poison that vitiates the national life.

Let us then go forward with absolute faith in the Dominion of Canada, prepared to develop its resources for the country's benefit as well as for our own, and when the year has come to its close, we will be able to look back upon it with joy and thankfulness.

Again we say, a happy and prosperous year to all.

Our doctrine:
To assist in the de-

velopment of the great resources of the Dominion of Canada through the dissemination of conservative information relating thereto, and to give entertainment, refraining from discussion of religious, racial, or political questions.

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Photograph, courtesy Canadian Pacific Railway

Malahat Drive, Vancouver Island, British Columbia, is one of the many delightful roadways in that primeval region

THE CANADIAN ILLUSTRATED MONTHLY

Vol. 6

Montreal, January, 1922

No. 11

Handling the Canadian Grain Crop

By Garnault Agassiz

"WESTWARD the course of empire takes its way" was never more eloquently demonstrated than in the case of Western Canada, which less than forty years ago, a vast wilderness, almost unexplored, is to-day one of the most progressive and most prosperous regions to be found anywhere on earth.

The growth of Western Canada is indeed one of the miracles of our day. Practically unpeopled thirty years ago, and with less than four hundred thousand inhabitants in 1900, the three Prairie Provinces have a present aggregate population of nearly two million. Cities and towns have sprung up as though by magic on every hand, thousands of miles of railroad have been built, and there is no rural region of the world in enjoyment of greater economic advantages.

Western Canada is now producing more than a billion bushels of grain a year, with every prospect of enormously increasing that yield within the next few years. This is a most extraordinary record, when one remembers that as late as 1900 the entire grain crop of the region amounted to less than fifty million bushels.

Two factors have been largely responsible for the remarkable growth of the Canadian West: first, the perfecting of a new wheat, which, ripening from ten to fourteen days earlier than the old types, has permitted an extension of the wheat belt many miles to the northward of

what up to 1900 was believed to be the limit of cultivation; and, second, the great water highway between the head of the Great Lakes and the sea, without which it would be almost physically impossible to market the large crops that are now being grown.

The grain belt of Western Canada stretches from Eastern Manitoba to the foothills of the Rockies, extending in the Peace River District as far north as the 62nd Degree, its westernmost limits being some 400 miles to the west of those of the American belt. All told, there are thought to be at least 200,000,000 acres of this area suitable for the cultivation of grain, and as only 30,000,000 acres are under cultivation at present, one will see that the potential grain crop of the region is at least seven billion bushels.



Photograph, courtesy Canadian Pacific Railway

Harvesting by tractor is becoming annually more popular in Western Canada



A field of Western barley

Photograph, courtesy Canadian Pacific Railway

Wheat is the chief money crop of the Canadian West, but it is not the only grain crop, for many millions of acres are devoted to the growing of oats, barley, and flax. In 1920, in fact, the oats crop was larger in actual number of bushels than wheat, the total yield being approximately 300,000,000 bushels, compared with an approximate wheat yield of 290,000,000 bushels, but the value, of course, was in no way commensurate.

Grain growing in Western Canada is at present confined chiefly to farms which grow nothing else. Diversified farming, although it has many advocates, has not been largely practised, because the soil has been so rich that the farmer has been able to crop it year after year without material evidence of deterioration. In this connection, it is well to reiterate the warning we have so often made against the one-crop system, which is pernicious, and has been found wanting everywhere it has been practised. Diversified farming will do ultimately for Western Canada what it has done for Illinois and Iowa. Wheat, no doubt, will remain always the great money crop of the region, its bill of lading universally negotiable, but to insure his

economic independence the Western Canadian farmer will have to practise grain growing as the chief unit in a general scheme of diversification, of which stock raising should be in no wise unimportant.

The Western farm varies in size according to the means of the farmer. Some men farm only half a section, which is 320 acres, but the average farm is at least a section or more in area. Then, of course, there are the great commercial farms, running into the thousands of acres, whose operations are carried on in the most up-to-date manner, just, for instance, as in a large factory or commercial organization.

But Western farming in itself is not a very complicated matter. The farmer plows most of his land in the Autumn, which means that all he has to do in the Spring is to run over it with cultivator and harrow. The wheat is sown from the middle of April to the middle of May, according to locality and the conditions of the soil, and so fast does the crop mature that by late August harvesting in many sections has commenced. The wheat is cut with the regulation binder, the sheaves being shocked in the field to dry, and later stacked, to await the arrival of

the threshers, who travel in gangs from farm to farm.

After the wheat is threshed, it is conveyed to the country elevator, of which there are now approximately four thousand in the grain belt. These elevators have a capacity of 10,000 to 40,000 bushels each. If the wheat comes to the elevator in bags, it is emptied into a hopper scale and weighed; if in wagon, in bulk, it is weighed on a standard wagon scale and dumped into the pit, the weight of the wagon, of course, being deducted. Should the farmer not wish to dispose of his wheat at the moment, he can store it in the elevator over any period at a fixed rate, the elevators of Canada all being under Government supervision and their scale of charges being fixed by law.

In addition to the country elevators, there are five large interior public terminal elevators of from 2,000,000 to 5,000,000 capacity, each located at what is considered an important strategical point in the belt. Here grain is stored in the event that congestion on the railroads prevents its immediate transportation to the head of the Lakes. These elevators are equipped with car unloading machinery and grain

cleaners, obviating the necessity of cleaning the wheat at Port Arthur and Fort William. The facilities for loading cars, too, are better than in the country elevators, the average time required for this operation being less than ten minutes as compared with an hour and a half for the country warehouse. The present storage capacity for the Western Division, which includes the terminal elevators at the head of the Lakes, is approximately two hundred million bushels.

Practically all of Western Canada's grain, except that sold to the local mills, of which there are many, the flour production of the three Prairie Provinces now approximating nearly 50,000 barrels a day, is sold on Government certificate of inspection, having to conform to one or other of the standard grades determined upon by the Grain Standards Board. At the commencement of the season, standard samples are sent to all the markets of the world, and all grain is graded to conform with them, the Government thus acting as a medium between the producer and the consumer and protecting the interest of each. All grain inspection is undertaken at Winnipeg. As a train, which generally has from forty to fifty cars, steams into the

city, it is met by a corps of inspectors. The door of each car is opened, and a cloth is laid on top of the grain immediately in front of the door. The inspector then goes over the car and takes a number of samples by forcing a perforated tube into the wheat. The samples are taken from every part of the car, and as taken are emptied on to the cloth. These samples are then all thoroughly mixed, placed in bags, and sent to the testing laboratories, where an inspection certificate is made out, and forwarded to the terminal elevator at Port Arthur or Fort William. This certificate both grades the wheat and estimates the amount of wastage. The net weight of the car is given, with so many bushels allowed to the elevator for cleaning, provided the inspection determines that the grain is in need of it.

The chief commercial grades of wheat are Numbers 1, 2, and 3 Northern, Number 1 Manitoba Hard having become so scarce that it now figures very little commercially. Last year more than 130,000 cars of wheat were graded at Winnipeg, in addition to nearly 50,000 cars of oats, barley and flax.

As has been stated, practically the entire grain crop of Western Canada passes through the twin

cities of Port Arthur and Fort William, and to handle it there have been constructed more than thirty elevators, having an aggregate storage capacity of approximately 50,000,000 bushels. Most of these elevators are built entirely of concrete and steel, and are equipped with the most modern grain-handling equipment. To the visitor, these elevators seem to line the horizon in never-ending procession, an eloquent tribute to the golden prairies of our Canadian West.

When a trainload of wheat arrives at either Fort William or Port Arthur, the various cars are distributed to the particular elevators to which they are consigned. Some of the larger elevators can empty twenty cars simultaneously, the grain being transferred from the car to the pit by power shovel, handled manually. From the pit, it is elevated to the top of the cupola by a mechanical contrivance known as the lofter leg, and discharged into a garner over the hopper scales. The lofter leg, which is an endless belt equipped with cups to scoop up the grain, travels at a speed of about 750 feet a minute, and centrifugal force and gravity unite to throw the grain from the cups to the spout of the garner. The grain is elevated at the rate of from 10,000



Photograph, courtesy Canadian Pacific Railway

A typical harvesting scene in the Western Canadian Wheat region



Photograph, courtesy Canadian Pacific Railway

Edmonton, Alberta, is fast becoming the metropolis of the new North which is being opened up beyond the hinterland

to 15,000 bushels an hour. From the garner, the grain is run by gravity into the hopper scales and weighed. It is then distributed to the storage bins, directly through the spouts or on a conveyor belt. Then it is drawn from the storage bins and screened and cleaned by standard grain cleaners, after which it is again elevated to the storage bins. These bins are about 80 feet deep, and are of hopper bottom. When the grain is to be shipped, it is again drawn from these bins into the lofts, elevated up and reweighed, and then run into special shipping bins, equipped with spouts which are spotted into the hatches of the vessel to be loaded, the grain being shot into the hold by gravity.

Canada's grain is sent chiefly to Port Colborne, for reshipment down the St. Lawrence via the Welland Canal and Lake Ontario in canalized craft; to the Georgian Bay ports of Midland, Tiffin, Derot Harbor, Port McNicoll, and Goderich, for rail shipment to the East, and to Buffalo, for export through American channels.

It was in 1883, the year the Canadian Pacific Railway reached the head of the Lakes from the Manitoba prairies, that the steamship "Erin," typical freighter of her day,

left Fort William, with the first cargo of wheat ever carried down the Great Lakes. In that year the total wheat exports of Canada amounted to only five and a half million bushels; in 1917 they amounted to the huge total of 189,643,846 bushels.

Many indeed are the changes that have taken place since the "Erin" made her historic voyage. The "Erin" cargo, for instance, was loaded with shovel and wheelbarrow, and the time required to place her 10,000 bushels aboard ran into days. Now vessels are loaded at the rate of 50,000 bushels an hour. The ships are also very different from those of the "Erin's" day. They are built of steel throughout, and are constructed according to recognized Great Lakes practice, being so designed that their cargo, which is in bulk, can be unloaded with the least possible delay. These vessels range in carrying capacity from 75,000 to 350,000 bushels for the most part, there being a few larger vessels, such, for instance, as the "W. Grant Morden," of the Canada Steamship Lines' fleet, whose record cargo of 490,724 bushels of wheat is as yet unchallenged by any vessel of either Canadian or American registry.

More than 250,000,000 bushels of grain were shipped from Port Arthur and Fort William in 1916, Canada's record year, and to carry it 273 Canadian and American vessels made a total of 1,460 voyages. Although Canada had only 84 vessels employed, these vessels carried over 60 percent of the total. Canada's fleet on the Great Lakes has grown remarkably in the past few years. In 1899 the combined cargo capacity of all Canadian owned steel ships was approximately 600,000 bushels. In 1916 it had grown to over 11,000,000 bushels. The average tonnage of Canadian vessels has shown a steady increase, especially since larger-than-canal size freighters have been built in Canadian yards.

When the grain ship arrives at the Lower Lakes elevator, she is placed in position, and what are known as marine legs are lowered into her hold. The marine leg is a mechanical conveyor, which elevates the wheat to the loft bin, from where it is elevated to the top of the cupola by loft legs, as already described.

There are many fine elevators at the various ports of the Georgian Bay and at Montreal, but the Government elevator at Port Colborne is so superior to any existing type that it

would seem to deserve special description. The Port Colborne elevator, which was built by Mr. J. A. Jamieson, of Montreal, who has designed a great many of Canada's grain elevators, has a storage capacity of 2,000,000 bushels. It is beyond question the most rapid and economical grain handling plant in the world. While its storage capacity is not so large as many other elevators, it can handle with ease 60,000,000 bushels in a short season of navigation. It has handled approximately 1,000,000 bushels in a single day of 12 hours, this including the loading and unloading of boats and the loading of cars.

The Port Colborne elevator holds every loading and unloading record in existence, and is said to operate at double the speed of any other plant. This elevator unloaded 165,000 bushels of wheat from the "G. R. Crowe," in less than four hours; nearly 400,000 bushels of wheat from the "J. H. G. Hagarty," in eight hours; while it loaded the "Key West," trimmed full to the decks with 85,000 bushels of wheat, in thirty-four minutes.

With one duplex car loader, the Port Colborne elevator has loaded 12 cars in a single hour. The cars are mechanically spotted, and two men perform the entire actual loading operations.

All the grain entering the Port Colborne elevator is weighed by automatic scales, this being the only

plant using this equipment entirely. There are eighteen scales in the elevator, each having a capacity of 12,000 bushels an hour. These scales weigh simultaneously 200 bushels of wheat a minute.

Ninety per cent of the grain handled by the Port Colborne elevator is loaded into vessels for carriage through the Welland Canal to Montreal. Every boat loaded is mechanically trimmed through high velocity, supplemented by gravity. The grain enters the ship's hold at a velocity of 5,000 feet a minute, which forces an even distribution of the cargo, obviating the necessity of sending men aboard to trim it.

Most of the grain shipped down the Welland Canal goes direct to Montreal, about two million bushels being transhipped into barges at Kingston, these barges being unsuited to navigate Lake Ontario. The reloading is done by the elevator of The Montreal Transportation Co., one of the finest in Canada.

The grain of Western Canada reaches the markets of Europe through the ports of Montreal, St. John, Halifax, Portland, Boston, and New York. Montreal shipped over a hundred million bushels of grain this season, surpassing all former records. She has two fireproof elevators, with a combined storage capacity of 11,500,000 bushels, these elevators being interconnected with her docks by an elaborate conveyor

system nine miles in length, which permits the simultaneous loading of nine ships. Further elevators are now under contemplation.

Nor must we overlook the growing importance of the Canadian flour milling industry, which is growing in importance annually, and with the extension of the wheat belt of the Western Plains it promises to have a future development of unlimited possibilities. For Canadian flour has no superior in the world, and wherever it has been marketed it has been more than able to meet the competition of other flour milling regions.

Canada, at the present time, has approximately 700 flour mills, with an aggregate capacity of 150,000 barrels a day. These mills are distributed throughout the Dominion, and amongst them are to be found plants that are fully equal in size and equipment to any in either the Old or the New World.

Some of these mills are of very large capacity, ranging from 1,000 to 7,000 barrels a day, but for the most part they are of comparatively small capacity, averaging about 200 barrels a day.

Among the largest milling companies in Canada are the Ogilvie Flour Mills Co., Ltd., of Montreal; the Lake of the Woods Milling Co., Ltd., Montreal; the Maple Leaf Milling Co., Ltd., Toronto; the Dominion Flour Mills, Ltd., Montreal;

Continued on page 53



A general view of Fort William, Ontario, showing the Kaministiquia River, down which so much of Western Canada's grain crop passes to the sea

Photograph, courtesy Canadian Pacific Railway

Up the St. Lawrence with Immigrants

WINDSOR STATION, Montreal, and its immediate environs are particularly interesting during the summer months when, periodically, the special trains running from the trans-Atlantic steamers at Quebec arrive at the depot and the stream of dishevelled and burdened humanity floods waiting room and concourse, at the same time imparting an effect which is strikingly picturesque and furnishing an additional touch of that cosmopolitanism which is the prominent characteristic of the Canadian metropolis. On such days, from the arrival of the trains until the Transcontinental leaves late at night, all available benches are occupied by the journey-wearied passengers and their baggage. Families camp there solidly as if in fear of straying in the unfamiliar city outside and missing the train which is to take them to a destination just as new and unknown. In the streets tributary to the station one encounters families laden with the lighter pieces of baggage, bearing that look of bewilderment and wonderment, standing hesitant before stores or restaurant windows, embarrassed as yet in the exotic atmosphere. They are of all nations, all types, all

By E. L. Chicanot

stations in life, but form one great class in their human contribution to the Dominion.

During the summer of 1921 immigration from overseas has been largely and distinctively British and of a gratifyingly high standard so that the atmosphere of the station and surroundings was to a great extent free from that agglomeration of swarthy faces, that babble of harsh sounding tongues, and that heterogenous aggregation of mid-European types which has so often in the past made the atmosphere not nearly so bearable and decidedly less odoriferous. Instead, one came upon the youth in cricket flannels and sports coat; the more elderly man in knickers and golf hose; women and girls in skirts obviously designed to give the limbs that freedom nature intended for them and shoes exhibiting all the capability of a twenty-mile hike. By their garments you shall know them—not quite the nattiest thing perhaps, but worn with ease and utter unconsciousness in the face of critical glare and

comment. They present a stern contrast, these new arrivals, with the spruceness and correct thing as viewed from the corner of Peel and St. Catherine in all the conventionality of Canadian business attire, but the newcomers do not seem to notice it or let it affect them. That English phlegm covers a multitude of thoughts, however, and in a very short while they will be Canadian in dress even if it take longer to assimilate other qualities of the country.

Just what exactly is an immigrant? Webster defines him or her as one who leaves his country for another with the purpose of residing there. But many of our British newcomers are inclined to resent the term as applied to themselves, limiting its interpretation to suggest an economically enforced exodus, a landing with the minimum of cash the authorities permit, and a general state of shabbiness. In conversation with new arrivals one has to be chary of the use of the word for emigration, for some reason, has come to suggest to them a lack of choice in the matter of leaving homes. However, the Dominion's interpretation coincides with that of the dictionary and all seekers of new homes in the



Newcomers to Canada from the Old Country awaiting inspection by the Immigration authorities at port of debarkation

Photograph, courtesy Canadian Pacific Railway



Photograph, courtesy Canadian Pacific Railway
A view of Father Point, at the mouth of the St. Lawrence, showing lighthouse, foghorn station and keeper's residence

gives a clearer insight into the characters of, and deeper feeling and sympathy for that vast army whose stream to our shores never ceases.

The earliest point of contact between the vessel arriving from across the Atlantic and the great Dominion is Father Point. Probably most Canadians have never heard of this little village, and to those who have, the name in all probability suggests little beyond the lamentable tragedy of the "Empress of Ireland," of which it was the scene some years ago. Yet this little Quebec cape, jutting out into the St. Lawrence where it is still an ocean, stands for the meeting place of two worlds, where the European immigrant gets his first touch with Canada, and the Dominion which has been the subject of such exhaustive speculation and anticipation begins to become a reality, where after days of horizon-rimmed ocean the beauties of the St. Lawrence bank begin to appear.

To the average citizen Father Point would appeal as a place to be passed as rapidly as possible, and having known some desolate localities of remoter Canada he might be tempted to accord it the superlative place. Tourists have never discovered it. It is off the beaten track and reached only by car from Rimouski. Even so, there is nothing to commend it to the ordinary holiday maker. A few scattered houses, the ubiquitous pretentious little church of the French-Canadian village—to most eyes it has no

Dominion are regarded as immigrants and entered as such in the country's records.

It is an illuminating education and a keen psychological pleasure as well as the most delightful of physical holidays to take a trip up the river on one of the Trans-Atlantic liners and accompany the hundreds of new Dominion citizens on the last stage of their long journey. It is a privilege that few but the ships' crews, bored and hardened to emotion from voyages rapidly following in monotonous order, may enjoy. In addition to being one of the most entrancing water trips imaginable, two days upon the calm azure of the St. Lawrence, gliding between its high wooded banks, one lives in an atmosphere where the old world and the new meet, where homes of birth, tradition, and sentiment are left irretrievably behind on the strength of a vague, somewhat indefinite promise. As a study of psychology and human emotion it is unrivalled, and when experienced



Photograph, courtesy Canadian Pacific Railway
Land in sight at last



Photograph, courtesy Canadian Pacific Railway
Old Country immigrants the past season have been of a sturdy class

attraction whatever. Only do the fresh breezes from off the St. Lawrence blow over it, giving it an atmosphere ever cool, bracing and invigorating. Only do the woods behind stand out in their emerald against the sombre gray of the rocks of the point, or blend with the darker hue of the river. No place for the ordinary holiday maker but what a haven for the neurotic and broken down, the brain-taxed and wearied toiler, in its brooding hush, its meditative calm, its healing quiet.

But great interest centres in the little hamlet for that army with its many ramifications which in Canada is concerned with ships and ocean traffic. Near the extremity of the point stands a modern lighthouse, each night flashing its warning light across the twenty miles of water. Close by is the giant foghorn which blasts its stentorian signal when fog enshrouds the light. Upon the hill stands a wireless receiving station which receives messages from every vessel entering the gulf before it proceeds up the river. A coastguard and life-saving station completes the precautions for preserving life and shipping.

But what holds the greatest interest is the little "Eureka," the staunch little Government pilot boat which leaves its pier on the point to take out a river guide for all vessels steaming up to Quebec and Montreal. Fully half the inhabitants of the little village would seem to be pilots, either

employed by the Government or by private shipping concerns. They live in the arrival of vessels, and when the wireless report is received of the approach all eyes are turned across the ocean of water to the distant horizon, and glasses and telescopes are focussed upon the speck as it appears over the rim of the earth.

The tiny dot grows larger and larger until it assumes distinct shape and one defines a giant liner bound from Europe, its passengers forming a blurred, dense, opaque mass as they crowd against the railings. When it has approached to within half a mile or so the pilot boat leaves its pier and steams gracefully out to meet its mammoth sister. In a very short time it is within hailing distance and forms and features take shape upon the giant liner as the little boat makes a deft turn about and is alongside.

Passengers in masses on the deck hang over the rail as the rope ladder is lowered and the pilot and immigration inspector clamber on board hard over hard. The casual passengers of the pilot boat become the cynosure of all eyes. There is much interchange



Photograph, courtesy Canadian Pacific Railway
A family of youngsters who should be the progenitors of good future citizens

of banter, waving of hands, fluttering of handkerchiefs, and as the pilot boat again pulls away, cheers and wishes of good luck. The huge vessel again vibrates to the propeller as it starts off again on the last portion of its voyage which is to end at Quebec or Montreal. The first intimate touch with Canada has been effected.

On board ship a dance is in progress, quite a formal affair, the majority of both sexes being in evening dress. The lounge makes an excellent ballroom and there is never a tremor as the vessel glides through the calm waters. Coming from the rude primitiveness of the little Quebec hamlet the brilliant scene presents somewhat of an incongruity. One wonders what certain of the young men will do with their glad rags when they exchange them for the overalls of a western farm, and how the girls in their soft, shimmery, flimsy gowns will look when they have exchanged them for the more practical gingham of a farmer's mate. It's a wonderful transition, but meanwhile there is not a care or worry in the world for them, the past irretrievably put behind, the future unanticipated as they disport themselves in waltz and fox trot.

They are not all budding agriculturalists by any means. Every class, every type, all conditions are represented in that species of democracy which is born on the ocean. Pairs are strolling about the decks, some trios, some quartettes, but overwhelmingly in pairs, for there is nothing so potent in generating romance as a sea voyage, though in a few weeks most will laugh at the fervor which they managed to put into these affairs. A ship's officer looks on with a rather bored expression and a cynical twist to his mouth. He has made many voyages and seen the same volcanic lovemaking so many times. Questioned, he attempts to fathom the causes which produce this atmosphere of romance but can get no deeper than venturing the opinion that some exotic quality influences woman on the ocean—something akin to the power of the moon but more potent. He quotes summer resort flirtations to back his theory up, though indications would tend to show that the male sex is just as badly inflicted by the same happy malady. He complains petulantly of a young couple who disturbed his slumbers the previous night by talking their sweet nothings under his port hole until late into the night. The

loves of an ocean voyage are wonderfully sweet, but oh, how brief.

Among the motley aggregation on board are many aspiring farmers, young and old, bound in the main for the western prairies. In a common sympathy and taste they seem to have discovered each other and sit seriously in groups pouring over farming handbooks, or discussing agricultural questions with that authority born of little knowledge. Stalwart, husky, and muscular in the main, they form a most welcome contribution to Canada and one for which she has the greatest and most urgent need.

One would have thought all the war brides and brides-to-be to have arrived in Canada long ago, but they continue to come. Some are enthusiastically happy, others in no little doubt as to the state of their own feelings, after such an absence from husband or fiancé they saw so little of. One good-looking English girl informs the others that the husband she married in khaki in England is to be at the wharf to meet her, and should she find that she no longer likes him she is prepared to book her passage back immediately. Another girl, according to passengers, has wept the whole of

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Photograph, courtesy Canadian Pacific Railway

Immigrants taking train at Quebec for their destinations in various parts of Canada

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A UNITED CANADA ESSENTIAL TO OUR NATIONAL PROSPERITY

NOW that the elections are over, and a new administration is in power at Ottawa, it is time to bury the animosities and differences of the last campaign, and, by rendering honest co-operation to the Government, hasten the return of the prosperity so essential to our national life. Canada is faced with many large problems at present, and their happy solution will require the undivided interest of the entire Canadian people. Therefore, the new Premier and his ministers should be given every opportunity, as the legally chosen representatives of the Canadian people, to undertake the difficult work of government unhampered by opposition born only of partisanship. Never in our history, perhaps, was there a time when patriotism should be placed above policy. For our part, we extend our most cordial wishes to the new Government, and trust that the administration, through liberality, tolerance, and justice to all classes, will bring a real prosperity to the land.



CANADA'S COAL SUPPLY

IN the measure of time it was not such a great number of years ago that coal was first discovered and found to give off great heat. A hunter had camped for the night in the shelter of a rocky ledge in the State of Pennsylvania. In the morning he found all the "rocks" around his camp fire aglow; it was coal in the rough. In this manner was a precious natural deposit brought to light, but even then it was not made general use of. Transportation of it to the cities was a matter closely approximating an impossibility. Farmers and backwoodsmen carted home some by means of horses, but that was as far as it

went. Later, with trains penetrating into the heart of the coal centres, it was mined in increasing quantities and brought out. That was the beginning. To-day, coal has come to be the hope of mankind. Fully ninety per cent. of the industries of the world are dependent upon it as a means to power; these would come to a standstill were it absent. Without coal, iron production would collapse; cities, now so brilliantly illuminated, would be dark; trains would stand motionless on the tracks. The busy factories would give up no hum of activity. The surplus wheat in the gigantic elevators would be of little use for there would be no means of getting it to the mills. Starvation would sweep the land, and, lacking fuel, multitudes would perish from cold.

This is but a trifling glimpse at the situation. In coal production the United States and Europe has led over all the rest of the world, the United States taking the foremost place. The greatest hard coal bed in the world is found in Pennsylvania. It underlies an area over one hundred and twenty miles long by thirty miles wide. In the fifty years that this area has been mined over 4,000,000,000 tons have been taken out. There is said to be about 15,000,000,000 tons left. In the course of producing this coal at least 40% is lost in dust and fragments. This annual wastage cuts into the coal supply an enormous figure but modern inventiveness has discovered no practical means of curtailing it.

The coal supply in the State of Pennsylvania, it is said, will not last 100 years, probably far less than that. At the present intensive rate of consumption and wastage the known coal supply of the world is roundly estimated by some not to last 450 years. Optimists, however, do not surrender to such meagre figures and boast that the coal supply will be at man's disposal for at least 2,000 years. In reckoning at the latter figure, it must be remembered that unexplored and untapped regions of the planet will turn up a supply that will be the practical saviour of mankind. It is estimated that there is 681,000,000,000 tons of coal left on the North American continent.

As the coal supply shows signs of lessening in the United States the North is looked to for relief. Canada has mined a great deal of coal in the past but the forward strides she has taken in this industry within the past years has been an eye-opener to say the very least. Nova Scotia is now looked up to as a great field; it has coal deposits in abundance; in fact coal production is very nearly the heart of its commercial life.

The Lady Cynthia Walks

OLIVIA yawned—and blushed. She yawned because she wearied of teaching Toby and Prue such dull stuff as geography and grammar.

She blushed because the saucer eyes of her charges grew round in shocked surprise.

Olivia knew it was in their minds to tell her how her predecessor in the schoolroom had *never* yawned, and *never* lolled, and *never* looked at the clock to see whether it were time to close school books and go out to play in the snow.

But then Miss Pyedell had been grey and sour whilst Olivia was golden-haired and sweet.

Poor Olivia! If only the Vicar her father had thought more of the bodies of those belonging to him and less of the souls of others who were at least no kin, she would not have needed to be at Birley Court as governess to two mischievous babes who she preferred to kiss than scold.

"The snow is crisp for balls," hinted Toby.

"And we dine upstairs because brother George brings a grand friend to the Court," added Prue.

"Hush," urged Olivia,—blushing for their sin o' gossip this time. "You may close your books, and get your coats and boots on. We'll go a-snowballing."

In gratitude they flung her more tit bits of hearsay.

"Sister Ann wears her new sacque gown," said Prue, "since Lord Margrayne comes courting."

"And you are to stay upstairs," added Toby, "since Ann told George you were too pretty to be casting sheep's eyes at her sweetheart."

"When Ann is married—," began Prue.

But Olivia caught the curled darling in her arms and raced with her upstairs.

For Olivia was young,—and, if she had not been a governess, might have been a madcap. But that was a secret none should hear.

So Olivia played the demure dependent prettily in public and aimed snowballs with accuracy of eye and strength of wrist in private.

Yet, because the wall was low, and Lord Margrayne happened to arrive on horseback, she obtained a full view of Mistress Ann's likely suitor.

He was not the least what she expected.

By May Wynne

For Olivia had seen lordlings before i' the distance, and pictured them all as mighty dainty gentlemen, with hatefully appraising eyes and languid interest in the weaker sex.

The young man who sprang from his horse was not on the right pattern. His cloth coat was plain as his neat cravat, his cocked hat boasted no braid. He might have been no better than a school usher had it not been for his horse.

Olivia looked at the horse, and she looked at the rider. She had time to see he had a handsome young face, brave, merry, and honest, and grey eyes too fine for mere man.

At a glance the girl could have wagered there was no vanity in him.

Then—it was Toby's snowball which missed her, and, flying over the wall, hit the noble lord full on the chin. Prue squealed in horror, Toby fled, then halted and returned. Olivia looked—and met the laughing gaze of those fine grey eyes. Just a minute for exchange of glances, then Sir George Backrane came out to welcome his guest—and Olivia fled.

It was Toby and Prue who came chattering back to the schoolroom after an hour with their elders. Olivia had been unusually idle. But —idle hours are not always wasted ones. And Olivia was vaguely bored over her task of placing Prue's curls in rags.

How the little puss chattered too!

"Lord Margrayne is not one bit like a lord," said she, "and 'deed, he's ninety times nicer than brother George. He pulled my curls, but not spitefully, and asked if I loved the snow and who was my play-fellow. I told him 'twas you and what Ann had said about casting of sheep's eyes. He laughed quite merrily and said I must be mistaking sheep for doves. Then we romped, and Ann pretended she liked it. I am sure Hal,—that's Lord Margrayne—would rather you had been there."

Olivia sighed. She wished she had been! for—for—for—after all she was young and gently-bred, and fifty times prettier than Ann with her black brows and black temper.

But of what avail to sigh?

The next day she taught, and sewed, and wrote, but moved not a pace from the schoolroom.

Mistress Ann had visited her and explained how they must request her to take her meals alone whilst her brother entertained.

There was challenge in the elder girl's eyes. She spoke so plainly that Olivia could have sobbed in chagrin.

For an hour after she wished never, never to see Lord Margrayne again.

Then she vowed she *would* see him—and win his interest.

But how?

Olivia stared out over a white world where the snow fell fast. If this went on there would not even be the church going at Christmas!

Christmas at Birley was not a prospect to bring the merry dimples to 'Livy's cheeks.

Her first Christmas from home. Heigh-ho! And, if her employers entertained, she supposed she would be condemned to remain up here in solitary confinement for fear her roses out-bloomed those of the daughter of the house.

When Toby and Prue returned at bed-time from play and sugar-plums they had more to tell her about a lordly play-fellow who hailed them as comrades, whilst Prue had a tale which troubled her since at bed-time one does not favor any talk of bogles.

"I don't w-w-want Hal to see the Lady Cynthia," she sobbed, "I don't w-w-want him to die. It's very cru—cruel of George to make such wagers."

Olivia soothed the grieving baby, whilst Toby with arms akimbo and silk-clad legs apart explained the tragedy.

"Prue is silly," said he, "Lady Cynthia walks only through the gallery and up the tower stair. She does not come a-peeping into children's cots. And I do not believe that seeing a ghost can kill any man. Lord Hal will be merry enough i' the morning, and play snowballing as he promised. 'Tis George who will grumble at the loss of gold pieces."

So Prue, being comforted, slept.

And Olivia, being curious, smiled on Alice the maid who brought her frugal supper.

Alice was niece to Mrs. Hubbard the housekeeper, who knew the history of Birley Court from the first building.

Olivia had a pleasant way with her and found no difficulty in engaging Alice in talk.

Yes, Alice knew the whole story of the Lady Cynthia who had lived a hundred years ago and been guilty of possessing a Jacobite lover who she lodged in the Tower. But in carrying warning to her dear she had been trapped by an angry relative, and the end of the tale showed tragedy, since Cynthia and her lad had died that night, and the ghost of the too-fond lady still haunted gallery and Tower, gliding restlessly to a tryst which Death attended.

"Her blue and white gown, all lace and flowered-brocade, lies folded in the lavender chest in the long attic," said Alice, "they say there's blood on it. Poor lady! It is a sad story for Christmas though snow lay on the ground when she died; but I must be off to see to Aunt's tansy tea or there'll be scolding."

So Alice departed, leaving Olivia to eat her supper and ponder amazing possibilities.

Could she?—dared she?—should she?—

Toby had told how Lord Margrayne in suggesting snowballing had asked if their kind play-fellow o' the green cloak would join them.

That single glance had evidently been remembered!

At nineteen Love comes masquing in romantic dress.

And Olivia hated her dull round of teaching. She wanted some of the glamour which lies around a pretty maid's dreams.

So that was why, when she ought to have demurely retired to her bed, Mistress Olivia took her light and crept tippy-toe to the long attic which was far cry from everywhere.

La! What a place! what dust! what rubbish! what—*rats*! /

Olivia heard a squeaking and her courage oozed. But—but—it was such a daring jest.

To play ghost trick on a lordling!
La!

Olivia opened the lavender chest with a hand that did not shake.

She was bold from long custom of looking out on to an old churchyard where owls hooted and moonshine played.

Ghosts had no terrors for the parson's lass.

And oh! the scent of lavender—the shimmer of satin, the pity of a dead girl's tragedy.

Olivia shed toll of tears for Cynthia and her Jacobite whilst she shook out the folds of that dainty robe.

Ah, the torn lace with the dull brown stain! The splashing on the fair brocade.

Poor maid! Poor maid!

Olivia sent her pity into the Great Unknown, then, with arms full of borrowed bravery, stole back to her own room.

What a dressing it was!

At home her brothers had nicknamed her "dare-devil Livy". The old dames of the parish had raised hands of horror to hear she was going governessing. But—what matter? She was young and joyous, but with no crooked thoughts under that thatch of golden curls.

Dead Cynthia had worn curls too, and had discounted powdered locks or high cushion. Olivia fixed a flowered bandeau across her brow and smiled.

The Jacobite lover in the Tower had not seen a fairer vision when his Cynthia came to him.

Midnight had tolled and moonlight stole wherever it could find entry behind shutters and curtains.

In the gallery a long shaft of light streamed like some fairy ladder across the polished floor.

Out into the radiance Olivia glided, then paused. She heard the quick intake of a man's breath near, and all at once panic seized her. She turned, quick as a flash, forgetting her ghostly glide in her haste to flee back; but she was too late. A gallant figure in dark green Court suit with fine lace at throat and wrists had sprung to bar her way. Ghost and watcher stood facing each other in a breathless moment.

Then the watcher laughed.

"Pretty Mistress Ghost," he pleaded, "have you a kiss for the man who trysts you?"

And, leaning forward, he caught her wrist.

Olivia drew back, only half laughing.

The young man in his handsome dress was certainly the same who had ridden to the Court two days since, but to-night he looked more the grand gentleman, possibly more apart from a mere dependent of a great family.

Yet the grey eyes smiled as frankly, the handsome face was as boyishly pleasant, the young voice gay and kind.

"Let me go, sir," begged Olivia. "'Deed, I ought never to have come."

"Of course you ought not," he answered, "but, on my faith! I'm glad you did. Come, little ghost, we will sign a compact, you and I. Confess—all, and receive—forgiveness."

"You'll keep my secret?" asked Livy, who was seeing all at once the

enormity of her offence and yet thrilling with joy over the adventure.

He vowed gallantly and led her to the window seat.

"You must be the dear teacher of Roley-Poley and his sister," he suggested, "who snowballs almost as well as she plays hide and seek."

"Or ghost tricking," laughed Olivia, losing her fear and remembering how young she was and how dull she had been.

"I will not believe you wished me harm," said Hal. "You are too sweet a ghost. But tell me—you will not fade away at cock-crow?"

She shook her head.

"Deed! I'm to keep to the schoolroom till you are gone. Perchance Mistress Ann will join my charges at snowballing."

"A freezing game," he mocked. "No, no. I want to play with my friendly ghost."

She sighed.

"Impossible. Ghosts belong to the midnight hour. To-morrow you will have forgotten."

"Shall I?" he asked, and looked into her eyes.

Such eyes had Livy!

And the minx knew how to use them.

"You are a cruel ghost," he vowed. "I know you will not cease to haunt my dreams. Why did you come—if you must go?"

She sighed again.

"To-night! To-night! Oh, it has been a mad hour. To-morrow you will jest at the impudent maid who dared to play a trick."

"Shall I? Shall I? Look in my face and tell me. Mistress Ghost, tell me the truth? Shall I jest at one who came to scare me with her shadow, and stole my heart—with her sweetest eyes."

"Sir! My lord! You're Mistress Ann's wooer."

"Am I? I think not. Her brother is scarce my friend. 'Twas my uncle's wish I should come. My own that I should stay—if every midnight brings a ghost."

"You are cruel, my lord. A maid's name—"

He flushed.

"I thought only of the ghost. Yet, I am a man of honor. Will you trust me with one more tryst, sweet ghost?"

"I ought not."

"Mistress Olivia, a bird whispers that you often do what you ought not! And I swear—"

"There is no need, sir. I'll come—but—only the once. To say good-bye."

She had risen to go. Her cavalier held both hands.

"I would not let you go had I not that promise. What magic do you wield, Mistress Ghost?"

"Deed, sir, I'm but a poor parson's lass. When I've gone you'll laugh at the credulity of such. But—I shall come to-morrow, to tell you you have been cruel."

"Shall you say as much? And, I say I'll wed no other maid than the little ghost who mocked my manhood, what then?"

"I should not believe. Good-night, my lord."

"Good-night, sweetest of ghosts."

He raised her hand and kissed it. Olivia fled.

She was breathless in her excitement. When she thought over that magic hour she believed she dreamed.

To-morrow night would show her cold reality.

Oh, yes, she was a little fool,—and the narrow mirror only showed her a soft young face with big brown eyes and golden curls to twine about a man's heart.

And never did man lose bet so cheerfully as did Lord Margrayne.

But what had John, the youngest lackey, to say to Sir George that morning which drove the baronet to his sister's boudoir in so black a rage?

Hightly-tighty! he soon roused in the lady a mood to match his own.

Did Lord Margrayne know, I wonder, that the County had its nick-name for the Black Backrane.

I warrant they deserved it to-day!

But family history — of a lurid character and little grace—showed a talent for deception. And Mistress Ann was smiling honey-sweet when she asked her brother's guest to walk with her to the village.

"For more snow threatens," said she, "and I would not leave my pensioners lacking a Christmas dinner."

So a promise to snowballers had to be broken, and his lordship, no doubt, felt mighty virtuous and deserving of reward after his charitable errand.

The storm broke later, and Sir George suggested cards. But Ann would have none of it. She wished to idle over the great hall fire and talk.

"Lord Henry will be weary after a sleepless night," she vowed.

Margrayne laughed gaily.

"So little weary," said he, "that to-night I take another venture. The ghost may honor me."

He did not see brother and sister exchange glances.

"Slap me!" grinned Backrane, "I'm not sure I'll not keep you company."

The other raised protesting hands.

"On no account. It would be an insult to the lady. Whoever heard of three for trysting?"

Ann drew down her black brows.

"You are bold, sir," said she, "this ghost is dangerous."

Hal's laugh was merry.

"She is true to her sex, Mistress," quoth he, "but show me a man who loves not danger and I will call him a shame to manhood."

So the matter passed, and, later, when Toby and Prue came for their romp with the new friend, they found him merrier than ever.

"To-morrow," whispered Prue as she clung round his neck, "we will go snowballing. I will tell you a secret too. Livy says if we play in the orchard *she* shall dodge behind the trees—and no one will hit her."

How his lordship laughed.

He had an idea he should be going to that orchard.

But before to-morrow came the night.

Was Mistress Ghost looking forward to her trysting? Did she know that he meant to break the spell of mystery? Day time—vanishing by taking her in his arms and kissing those sweet lips as seal to loyal troth.

No other than his little Mistress Ghost should ever bear his name and rule his household.

"One game o' cards," urged George Backrane, shuffling the pack, "'tis too early for bed."

"You forget," laughed his guest, "I tryst your Lady Cynthia."

"Ah!" said Sir George, "a word in your ear, Margrayne, since Ann has retired. There's reason why that tryst of yours should not be kept. 'Tis this way. A wench of the household, too saucy for modesty, who will be turned out bag and baggage anon, has vowed to trick you by masquerade. The news was brought me by a trusty man-servant who suspects the lass of possessing a lover who will rob the place whilst she apes and ambles in borrowed bravery. But Belton is ready for her. Darkell and Hugo, the hounds, will be loose in the west wing, and, if there be too much flesh about our Christmas spirit, they will relieve her of it."

The speech was drawled, carelessly and yet with deep intent.

Sir George's coarse features flushed in triumph. He leered as he looked at the man whose young face had suddenly aged in white horror.

Margrayne was on his feet. His eyes blazed. With a turn of his wrist his rapier was out.

"You devil!" said he,—then turned to rush from the room.

Sir George, cursing like a pot-boy, stumbled up to follow, but, tripping over a rug, fell sprawling, bringing the card table and lighted candelabra crashing.

Margrayne had not heeded.

Already he was on his way—to a rescue.

Passing down a passage the door of Mistress Ann's room was opened, and Ann in charming déshabille stalked out.

"Hal," she cried. "My——"

He pushed her aside with no more ceremony than if she had been a kitchen wench, whilst he ran on.

Hark! A sound of deep-throated baying. The hounds were loose.

Across the polished floor of the gallery the moonlight lay; and, in the moonlight, a slender figure, golden-curled and dainty, with stiff brocaded gown and blood-stained laces at its breast.

Margrayne had no time to reach his little Mistress Ghost. With a gallant rush he was between the latter and two black fiends with slavered jaws and red-rimmed eyes.

He heard Olivia scream. He cried her name.

"Go back, go back, Olivia."

Then, his first blow was struck.

It was likely to be a stern battle,—and the man knew it. Even as the rapier sheathed itself into a broad black breast, Death came with a yell of fury to take his toll. Open jaws threatened, red-rimmed eyes warned the human foe of speedy doom, when, with a clatter of high heeled shoes, a figure in blue brocade raced forward, a chair held high in strong young hands.

Crash! She had muscle—and a superb courage.

But courage was not the inspiration which set a young girl face to face with a grim black hound.

Sober-sided, middle-aged Reason may mock at talk of Love born in so brief an acquaintance. But 'tis true that those two had looked across a snow covered wall to know on the instant that each had found the only mate.

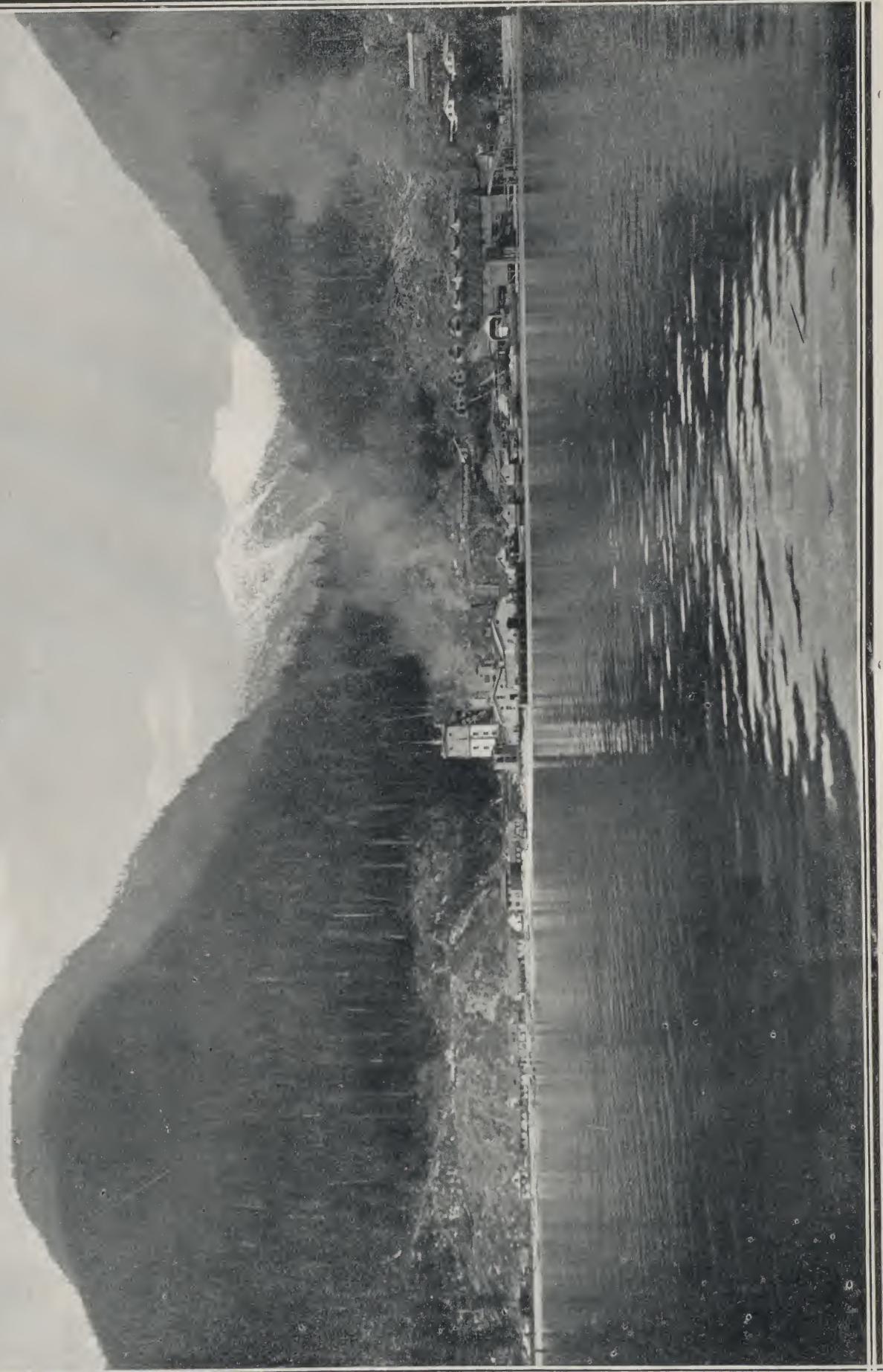
And now, as Hugo made its bound at her lover, the chair splintered in its face.

With such force indeed had Livy wielded her weapon that, hampered by old world furbelows, she tripped and fell a-top of dog and chair.

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Photograph by Garneau Agassiz

The Wood Fibre plant of the Whalen Pulp & Paper Company is beautifully situated at the head of Howe Sound, British Columbia



The Badlands of Alberta

IN Central Alberta, along the course of the Red Deer River, north and east of the City of Calgary, lies a narrow strip of valley, whose lands are called "Badlands," from their similarity to the more extensive "Badlands" of the American West, from which they differ, however, in not covering an acre of the upper surface of the plain, being confined entirely to the river's bed in the form of a valley enlargement.

The Canadian "Badlands" lie some hundred and fifty miles from Calgary, in a canon some four hundred feet in depth, the contiguous country being a flat wheat-growing plain, largely covered by glacial drift and boulder clay. The climate of the region is one of uncertain and scanty though at times violent rainfall, and after saturation the heterogeneous glacial drift slumps away down the slopes of the outer edge of the steep canon side, thereby exposing the underlying clays and sandstones of the Dinosaur beds.

This process is intermittent and very slow, but it is most probable that during the retreat of the glacial ice sheet the Red Deer carved its valley,

By W. E. Cutler

and that the erosion of the valley and its walls was very rapid. The upper parts of the canons are more or less sewn with large and small boulders and some enormous blocks of ice-transported granites and gneisses and Palaeozoic limestones from the Northwest, which the weathering of the drift has left behind. Curiously enough, I once came upon a sandstone hillock of deep lichenous growths, showing practically undisturbed condition, covered by various sized boulders, and also by the bone plates of the Ankylosaurian Dinosaur, yet not one boney plate, though many of them were frost shattered, was touched by one of these recently superimposed boulders.

A question frequently asked is as to the origin of the name "Badlands." The priests in their early occupation of the American Southwest so named all lands where no crops would grow, and where only the rattlesnake and gila monster, scorpion, and centipede dwelt in the sunburned sage and cactus. Of these

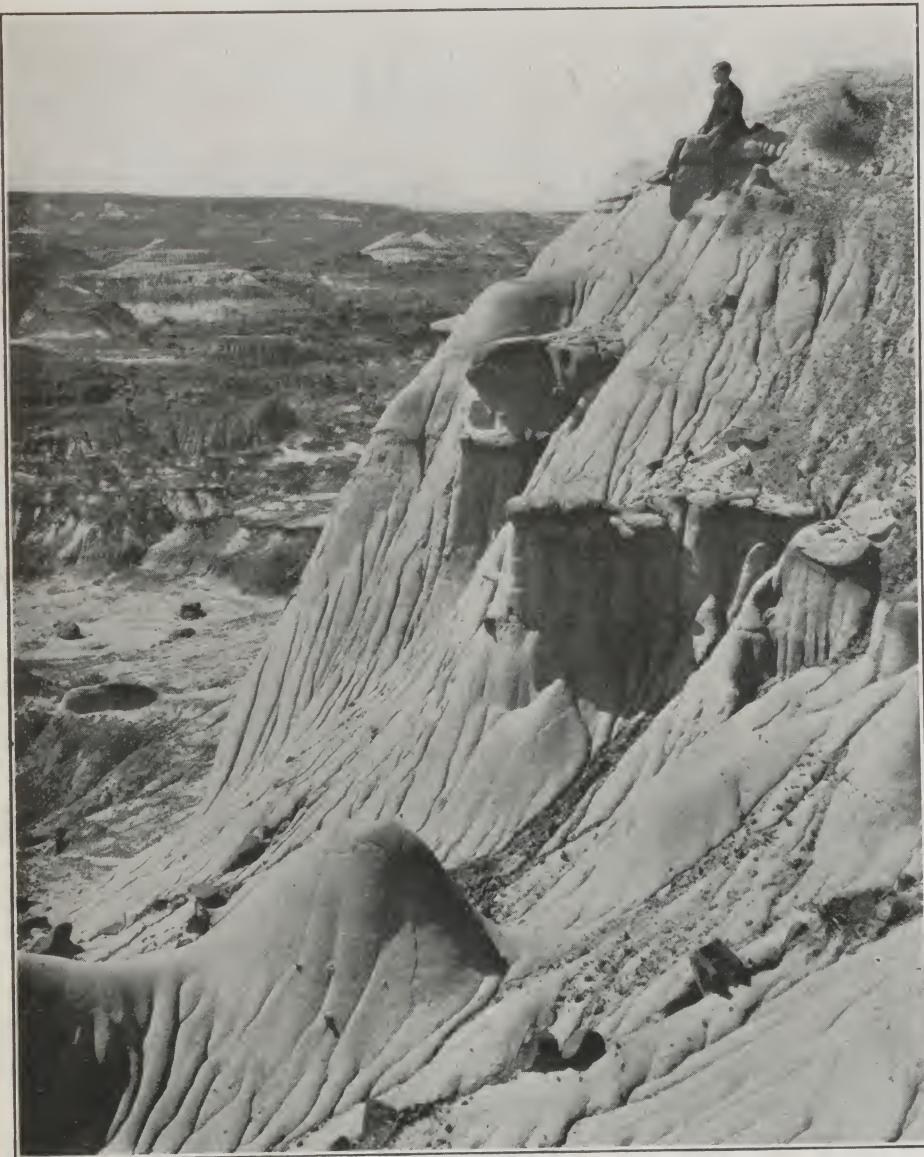
interesting, but to most people somewhat repellent creatures, only the scorpion inhabits our Badlands and then occurring seldom and of small size; the two specimens which I have found living measured a bare two inches in length.

In the Badlands of the Southwest, the skeletons of men and of beasts of burden often encumbered ground from which protruded the gigantic bones of Dinosaurs; here, however, their smaller extent and cooler climate precluded such tragedies. Where ancient and modern bones intermingle, an unfortunate cowbeast leaves its skeleton here and there to mark some winter's tragedy. Some twenty years ago the graceful antelope was a frequent visitor, and buffalo bones still fall from the wash banks of tributary creeks. To-day, however, the chief inhabitant is the coyote. Mice, too, are found in tremendous numbers as anyone camping there for long will discover. The black and yellow bull-snake is also common, but it is harmless to man and very handsome.

Now a word as to the geologic history of the region. Shortly be-



Photograph by W. H. Robinson, Official Photographer, Canadian National Rys.
The camp of the dinosaur hunters in the Red Deer Valley, Alberta



Photograph by W. H. Robinson, Official Photographer, Canadian National Railways
The Red Deer Valley is noted for its peculiar sandstone formations

fore the termination of the Cretaceous epoch, came a large and long threatened uprising of the American western continent, being the prelude to the end of the reptilian aristocracy. Such great faunal changes were thereby produced as to justify the naming of Tertiary, the third or newer epoch of the world's history. Whether by the elevating of terrain on a wide-spread and well-evidenced scale, thereby reducing land moisture and vegetation and consequently such animal life as thrived in and upon such conditions of warm moisture, with its consequent rich vegetation, or whether, as suggested by one modern geologist, the predominating lowlands were swept by colossal tidal waves caused by earthquakes which must have shaken the whole of Western America upon an enormous scale from the Arctic to the Antarctic, one fact is

so far undisputed by any newer evidence, and that is that at that stage of geologic history where the underlying Cretaceous and the overlaid Tertiary beds show great unconformity, the gigantic Saurians, the Plesiosaurs and Dinosaurs leave no more traces of their being. A considerable lowering of temperature would be certain to steadily take place, owing naturally to decreased humidity and increased elevation. Certainly the testimony of the rocks is of an inelastic and abrupt quality, but despite even liberal and broad interpretation of the possible hiatus between Cretaceous and Tertiary time, there still remains an abrupt transition from a world of reptile giants to one of few and those pygmies. To my mind the probability is that a vast age elapsed during the volcanic and orogenic disturbances taking place

with little or no record possible by fossilization. The probable approximation of age in years of our time of this geologically recent but humanly very ancient epoch, is placed between three and five millions of years, since these deposits of sands and clays and their buried giants, now covered by thousands of feet of strata, were gently accumulated by the old rivers of the West. It is also to be remembered that other thousands of feet of more recent deposits have been removed by the retreating ice-cap.

The region now including the Badlands of the valley of the lower Red Deer river of Central Alberta was covered during most of the age of the giant reptiles, to wit, the age of the Mesozoic epoch, or middle age of the world, by a shallow and warm sea, by no means tropical, with seasonal changes, of a warm temperate climate, possibly like that of Florida. This enveloping of the western plains region by ocean alternated with more or less local and temporary uplifts of the terrain above sea-level, originating from west, large sluggish and sandy rivers with a rich vegetation of warmth-loving plants and trees, with low swampy and estuarine lands bordering these rivers. The Western Cordilleras, excluding the Rocky Mountains, which had not yet appeared, were the highlands supplying the necessary sediments.

With the exception of bands of readily fracturing clay ironstone, of which there are extensive shallow beds throughout the Belly river series, pebbles are very rare in this formation. They are almost exclusively of quartz or onyx, and of small size, rarely as large as a pigeon's egg. A few of over one pound in weight were probably locked in the roots of floating trees, the smaller pebbles are supposed to have often been the stomach-stones swallowed by these reptiles, birdlike, which are also supposed to have possessed a gizzard, they having been found in place in skeletons. This lack of heavy material in the strata betrays the small fall and quietness of the waters of those old rivers. There do occur what are called by the bone-hunters "Bone-beds," shewing much wear and containing massive bone fragments with edges quite rounded, in which beds are intermingled a jumble of Dinosaurian and crocodilian bones and pieces of turtles, teeth of reptiles and fishes and scales of the armored Gar-pike.

The greatest size or length of any known Dinosaur is probably attained by Diplodocus or Brontosaurus from



Lowering a half-ton block of Ankylosaurian Dinosaur from quarry

the much older Jurassic strata of Wyoming, U.S.A., almost utterly aquatic vegetarians almost too massive to progress on land alone. Interesting, however, are these bone-beds, yielding occasionally a more or less complete Dinosaur skull, or claws of turtles and carnivorous Dinosaurs, and sometimes, but very rarely, the scattered teeth of tiny marsupial mammals the progenitors of our later, possums, cats, insect eaters and monkeys. Bands of limonite or black bog-iron, rich in metal but of too diffuse a form for economical use, synthetised from the iron of creatures once inhabiting these swamps, form a prominent feature in the landscape, their black banding contrasting strongly against the ash-gray clayey sandstones, and their slowly perishing debris strewing all the lower slopes of the white buttes. Occasionally one will find well-preserved leaves showing every vein, pine cones (*Sequoia*), and even seeds of deciduous trees and shrubs. Bones and even skeletons occur in this non-freezing rock substance but are almost impossible of removal. When freed of the ironstone by the weather, the contained bones are often in the very finest preservation.

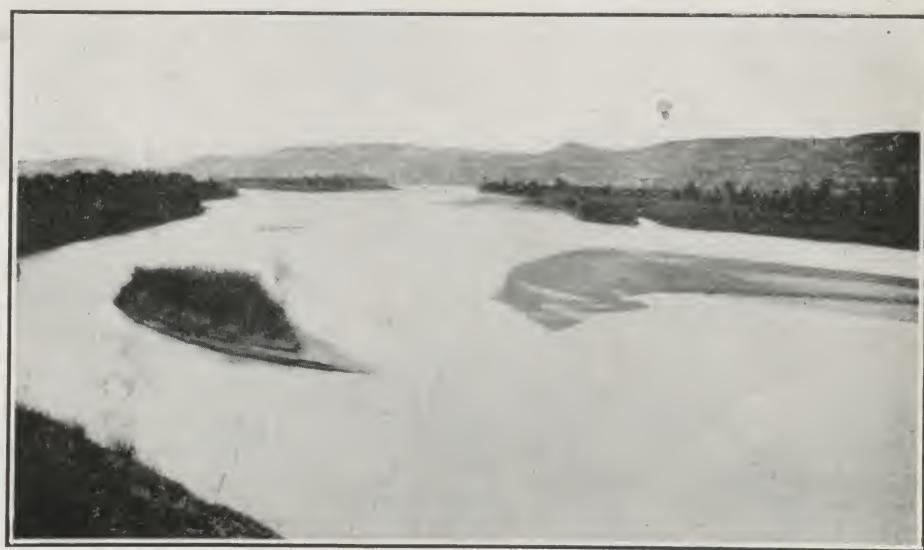
It is often asked how the skeletons of these large reptiles are found, whether the palaeontologist digs for them or how does he find them. It resolves itself into a matter of inferential reasoning, plus a practised eye. Following canons or ledges, high up on sloping rock faces, he notes the debris fallen from above, just as the mineral prospector does "the float," and must decide whether a heap of bone fragments from large to tiny pieces, originate from different parts

of one skeleton or are the long accumulations of slowly breaking up remains protruding as the scanty rainfall washes away the covering sand-rock. If he finds spines of vertebrae or many rib fragments at base of slope he will search above for their origin, and then his experience, and consequent judgment and initiative, will decide his action. Should a prospect occur in a semi-perpendicular rock wall and many specimens occur in such positions on Big Sand Creek and elsewhere, left because of the expense entailed in uncovering them, he will probably consider the prospect worth noting, but unless showing very perfect or new features, after a little development, he will relinquish taking the specimen out in preference of an easier undertaking.

If, however, the enclosing rock slopes back, is therefore shallow and

the slope of low angle, the procedure is to remove the top layers with large pick and shovel until there remains only about one foot of cover, when slowness and care will be necessary with the small pick and curved awls for grooving around and tracing the bones and a whiskbroom to brush away the dust and debris, and a shellac bottle and brush to paint the exposed bones and give them a little more body. They do not crumble upon exposure to the air, although wetting by rain will cause the enclosed gypsum to puff and break up the bones, but are seamed by many tiny hair-cracks, caused by slow slumping and shifting of the isolated rock mass. The shellac preserves their surfaces, and when sometimes the bones are powdery by mineral decay, very dilute shellac is dripped upon them until they will soak up no more, and the next day they will be firm and their contour can be thus preserved until they reach the laboratory.

After the rock cover is removed and the first bones are showing, the art is to cut small trenches around them without jarring, and to remove the rock between, so that when the last parts to be found are uncovered, the traced skeleton stands out in bas-relief like a fresco on the rock platform. The remains then, if covering a large area of surface, are divided into sections by deeper trenching to enable the operator to reduce the size of the blocks which will be numbered. Then he places tissue paper upon the bone surfaces by means of splashing on with wet brush, a performance of considerable skill in the frequent gales of this region, and upon this he kneads or dabbles strips of sacking dipped in



The left bank of the Red Deer River, showing sandbars



Camp Mexico Ranch and the author of this article, Mr. W. E. Cutler

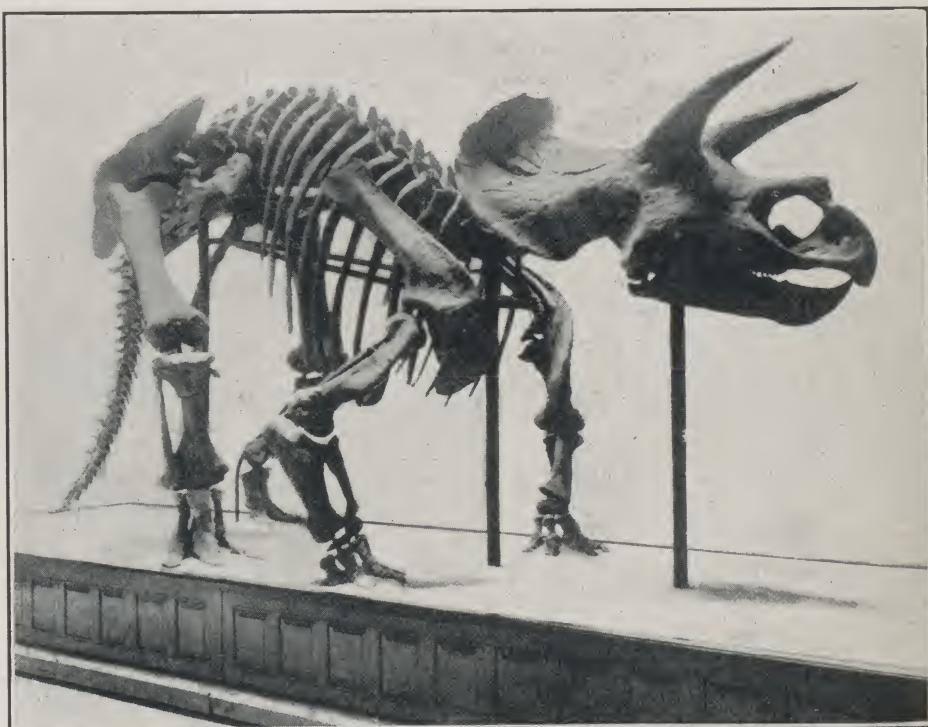
liquid plaster, giving two or more layers according to size of blocks and enclosing sticks for stiffness. The block is then plastered underneath until its pedestal is reached and then by one blow undermined, and the reverse, or base, showing no bones, is plastered similarly without papering.

Often do the bones weigh more than a ton. One sent to London in 1914 by the Calgary Syndicate of Prehistoric Research measured 6 ft. 6 ins. x 6 ft. x 3 ft. deep and was built of two-inch boards reinforced by pieces of 2 x 8, and bolted with long iron rods. This block weighed two tons or more and enclosed thorax or front body and limbs of Ankylosaurus, an armoured Dinosaur, with the bone armour plates in place interlocked as in life. Dr. W. D. Matthews, curator of vertebræ palaeontology of the American Museum of Natural History, New York, informed me that this specimen was complimentary to theirs, completing the knowledge of the body armature of this ponderous saurian, over 6 ft. wide between the hips. It is much wiser to take large slabs of rock, irrespective of weight, in a case where a matter of structure or of skin ornamentation or of armature, previously unknown, is concerned, rather than to do much trimming for the sake of lightness.

To judge the weight of these monsters in life by the weight of their fossil bones is impracticable and misleading, as these bones are silicified and almost composed of siderite to-day. The very bone cells and the nutritional foramina or arterial cavities are wonderfully preserved, but

the whole structure of the bones has been metamorphosed into a mineral constituent of much greater density. Still, when one considers the skeleton of an Hadrosaur or duck-billed Dinosaur with thigh and shin bones measuring each some 40 ins. in length and a total body length of some 32 feet, and with an erect height of fourteen feet and tremendous girth, the creature will have weighed somewhere around that of a large African elephant, if not more, despite the porosity of the limb bones. Three to five tons might be a fair estimate

of the probable weight in life of a large duckbilled Dinosaur. Approximations in such cases are quite justified and valuable as a means of comparison, whereas definite statements regarding the weight, coloration, speed, etc., of animals of whom we only possess the bony framework, are not only unscientific but naturally tend to produce mistrust in the mind of the thoughtful reader. Ankylosaurus, for instance, in spite of his small stature, some six feet, with his enormous width and a length of say 20 feet, quadrupedal, and covered with most dense and massive armour, some of the plates being over one half inch in thickness of solid bone with a solid club of bone on the tail some four inches thick and as large as a cabbage, with large triangular crests of bone on the back and two or more spines like horns in that region, and with a densely plated skull, must have been massive and weighty almost beyond imagining. There is also to be considered the fact that such armature would certainly be covered by a hide or skin of most probably great thickness. One observes bones occasionally showing the marks of the great teeth of the carnivorous Dinosaurs, probably of Gorgosaurus in the lower Red Deer river region and of Albertasaurus in the upper or Edmonton beds, with the grooves where the great teeth slipped through gristle



A three-quarter front view of Triceratops Proscus in the United States National Museum



Skull and jaws of the great armored Dinosaur *Ankylosaurus*, which has been described as the most ponderous animated citadel the world has ever seen

on the bone as plainly as though of yesterday. I once found three metatarsals or bones of the palm of the foot, this a hinder one, the larger being 14 ins. in length and of the girth of a very large human wrist, each bearing the tooth marks sunk deep into the then green bones and slipping off at an oblique angle to the length of the metatarsals. These foot bones belonged to an Hadrosaurian or duckbilled Dinosaur, which must often, alive or dead, have furnished a rich meal to the giant predatory forms existing then. They may have been tigers or they may have been jackals, or both, in their habits, but considering their weapons of offense and defense they would appear very prepared for aggression. The bones coming from the upper Red Deer river fossil beds of the younger Edmonton series are much heavier, the cells being mostly filled by silica, they are also much harder and less perishable than those of the lower Belly river series but are less perfect fossils. They show in their representative Dinosaurs, a different and sequentially younger fauna.

It is occasionally asked why these giant reptiles only lived in this part of the country, and whether their occurrence in such apparently large numbers points to their having been buried by some cataclysm or convulsion of nature. It is a very common error to revert to the exaggerated and unusual for an explanation of happenings which can be logically traced to quite simple and ordinary causes. The Dinosaurs and their contemporaries, the various Crocodilians, turtles, Plesiosaurians, etc.,

inhabited large areas of Western America, as they also were represented wherever land was and conditions favorable, over large areas of the earth. It is to be remembered that the fossils, such as those of the Red Deer river valley and its "Badlands," show a preservation of most or much of the life of those days in that region, conditions most necessarily favorable for their preservation being present; such conditions are namely, large areas of lowlands and mud-flats with rivers heavily burdened with silt and a slowly sinking sea or estuary floor, similar to that obtaining at the mouths of some of the world's great rivers today, where thousands of square miles under water are being steadily covered by the continental waste and where

the remains of modern living things will be more or less well represented. Should one be in a position to lay bare the rocks of this series anywhere in their thousands of square miles, the same remains would be exposed; the river and its valleys of erosion have accomplished what man could hardly do in excavating and bringing these ancients to light. For the same reasons, with opposite conditions, very few of the recent buffalo swarming on these plains of North America will be preserved as fossils eventually, though doubtless many of their skeletons are undergoing the preserving process in the beds of lakes and muskegs. The simple reason of this is that most of the land of western North America lies at more or less elevation above sea-level, and failing a large and definite depression of the northern lands under the Arctic ocean, the eroding rivers and their canons will eventually, however slowly, destroy the last resting place of these numerous quadrupeds and their buried remains.

The most frequently found remains of Dinosaurs of this region are those of the duckbilled, bipedal, herbivorous and semi-aquatic types, the Trachodonts or Hadrosaurians; the family name of Hadrosaurus is preferable to that of Trachodon, the latter being disqualified so far as concerns those of this region, owing to lack of original classificatory material, also the name of Hadrosaurus (Leidy) has claim to priority. The Genus Trachodon was apparently founded weakly upon teeth of varying characters. Most of these duck-bills, so named from the likeness of their mouths to that of the duck,



Ilium bone of carnivorous Dinosaur in plaster covering



Photograph by W. H. Robinson, Official Photographer, Canadian National Railways
This is the character of topography common to the Red Deer Valley between Steveville and Cravath Ferry

reached a considerable size, with a maximum in these beds of the lower Red Deer river of Belly river age of some thirty feet in length and an upright height when erect upon the large hind legs, of some fourteen feet. They were smooth skinned, with a pattern of small polygons and no armature; the teeth, some hundreds in number, renewed by growth from below, those worn being shed and commonly found, betray the vegetarianism of these beasts, and the massive horny bill would macerate the vegetable matter before it reached the platform of flat weak teeth behind. These Hadrosaurs were of many different forms.

These animals, the Hadrosaurs or Duckbills, had large hind feet, with spade shaped hoof-like toes, five in number behind, but their front legs or forearms were comparatively weak, and very small considering the size of the hind limbs. They could not have borne the creature's weight in walking or climbing but must have been used similarly to a squirrel's method of feeding. A kangaroo-like attitude might have been taken with similar progression, or perhaps a striding. They were most probably harmless, inoffensive animals, and

their semi-aquatic life, proven by the finding by the great collector, Sternberg Senior, of a specimen showing traces of webbing between the fingers, would largely account for their greater numbers in preservation. Curiously enough, in spite of this frequency, in my few years of collecting I only found two skeletons of this family. Next in frequency of remains are the *Ceratopsidae* or horned faces, which were also herbivores, but quadrupedal and possessing well armored skulls and necks; in fact, their armature eventually became excessive and over-specialized, betraying or predicting the end of the race, a very usual course in nature. These Ceratopsians range with an approximate length of from twelve to twenty feet, and a height of some 5 to 8 feet, from forms with small or rudimentary horns above the eyes, or brow horns and large horn above the nose, to forms with rudimentary nasal horn and a very large supra-orbital horn. The nose or snout was ended by a massive and formidable bony beak of half an inch thickness of solid bone, resembling somewhat the mouth of a snapping turtle. They, like the Hadrosaurs,

were of unarmoured covering, save for the skull and neck; the latter was covered and protected by an enormous frill or ruffle of bone, in life covered by thick hide, which sometimes gave the skull a total length of eight feet.

There is at present in Calgary, stored in some 14 boxes, a skeleton of Eo-Ceratops which fairly well represents one side of the Dinosaur and is, with a good skull with the rear elements present, which were so far unknown, the best or only skeleton of this form. It will not be developed in Calgary but awaits purchase by some capable Institute. It was obtained after removing a hill of sandstone, some 12 feet in thickness, during the winter of 1919-20.

There remains of the vegetarians the low-set, enormously wide and squat, Ankylosaurus or Euplocephalus of heavily armoured tiny toad-like skull, also beaked, being one of the regionally so characteristic *Pre-dentata*; his neck was covered with tiny square thick bony scutes, on the shoulders or back were two large horn-like spikes of solid bone, over the whole upper body or dorsal region

was a covering of ridged, oblong, shield-like plates of great thickness from the size of a quarter dollar to that of a large plate. The skin or hide was apparently naked below, and I have taken specimens of it with a small polygonal pattern with the specimen now in South Kensington, London, obtained in 1914 under the expedition of the Calgary Syndicate of Prehistoric Research. There are several forms of these armoured Dinosaurs, but they are not well known as yet. The Carnivores or tiger Dinosaurs, Megalosaurians, are well represented by gigantic to tiny forms, one, judging by the claws, must have been no larger than a turkey; the skeletons of all of these predatory, forms greatly resemble the bird's anatomy, both in the pelvic region and in the pneumatic limb-bones with the welded tibia and fibula of the lower leg, showing only a rudimentary fibula, an indication of speed adaptations. Gorgosaurus, a colossal reptilian with a length of about 30 feet and a height of over twelve, possessed claws, the bony cores of which measure 8 inches along the outer curve and measure one

inch in diameter at base. The teeth were conical, curved backward with serrated edges; they were of alternating heights in the jaws, short and long following one another and protruded in the jaw one or two inches.

The structure of the carnivorous Dinosaurus betrays a leaping action and the olfactory or smelling lobes of the brain are well developed. Another form, Ornithomimus or the bird mimic, rare in preservation, being frail in structure, was obtained by the New York Museum in 1914. It was a lengthy bird-like creature of some twenty feet in length, which ran bird-like erect and probably lived upon fishes and warm-blooded creatures like birds which had already made their appearance in the world in the long previous Jurassic era, but naturally birds are rare as fossils and so far no definite traces thereof have come from Alberta. Crocodile and turtle bones, and the bony scutes of the former of rectangular shape, with fragments of shell of the latter, occur frequently; the vertebrae of the Rhyncocephalian or beak-headed Champsosaurus, a crocodilian

like a modern gavial, with its long thin snout, and the larger vertebræ of the Hadrosaurians or Duck-bills with turtle-shell fragments, are the commonest fossils and occur on almost every hillside not covered by vegetation. The turtles were everywhere numerous, viz., the Trionyxidæ, Adocidæ and Balaenidæ, the former of the size of an ordinary plate and the latter two reaching the dimensions of a large tub or basin. Teeth of the large and small Carnivores are fairly common, Crocodilians quite plentiful; of the shark Myledaphus very common; also teeth of the Duckbills are common, with an occasional one of the Ceratopsidæ or of Ankylosaurus and very rarely one of the small mammals.

These fascinating and bizarre lands, following the course of the lower Red Deer river and reaching back one or two miles from that watercourse, are very accessible by horse or motor from the newly constructed railway from Bassano to Empress. From Millcent, branching off from main line at Bassano, is Circa, fourteen miles, to the charmingly placed village of

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Photograph by W.H. Robinson, Official Photographer, Canadian National Railways.
The "Hoodoo" near Steveville, Alberta



Notes From the Canadian Capital

B. Stone

WE have recently come through that stirring national episode known as a general election. The event in itself, and especially in its incidence, is easily the outstanding political development of the year. The wheel of fortune has taken a rather violent turn, the red goes up, the blue goes down. Mr. Mackenzie King comes to taste the sweets of office and its responsibilities, while Mr. Meighen sips the gall and wormwood of defeat. Even defeat has its compensations in release from the cares and worries of a peculiarly strenuous period in national life. We know all about the campaign and its outstanding characteristics, with the Government party seeking to make the tariff the one dominant issue and the Liberals and the progressives insisting upon putting into the melting pot ingredients other than the fiscal policy. For fully three months the electorate from Sydney to Vancouver were harangued

By Charles Bishop

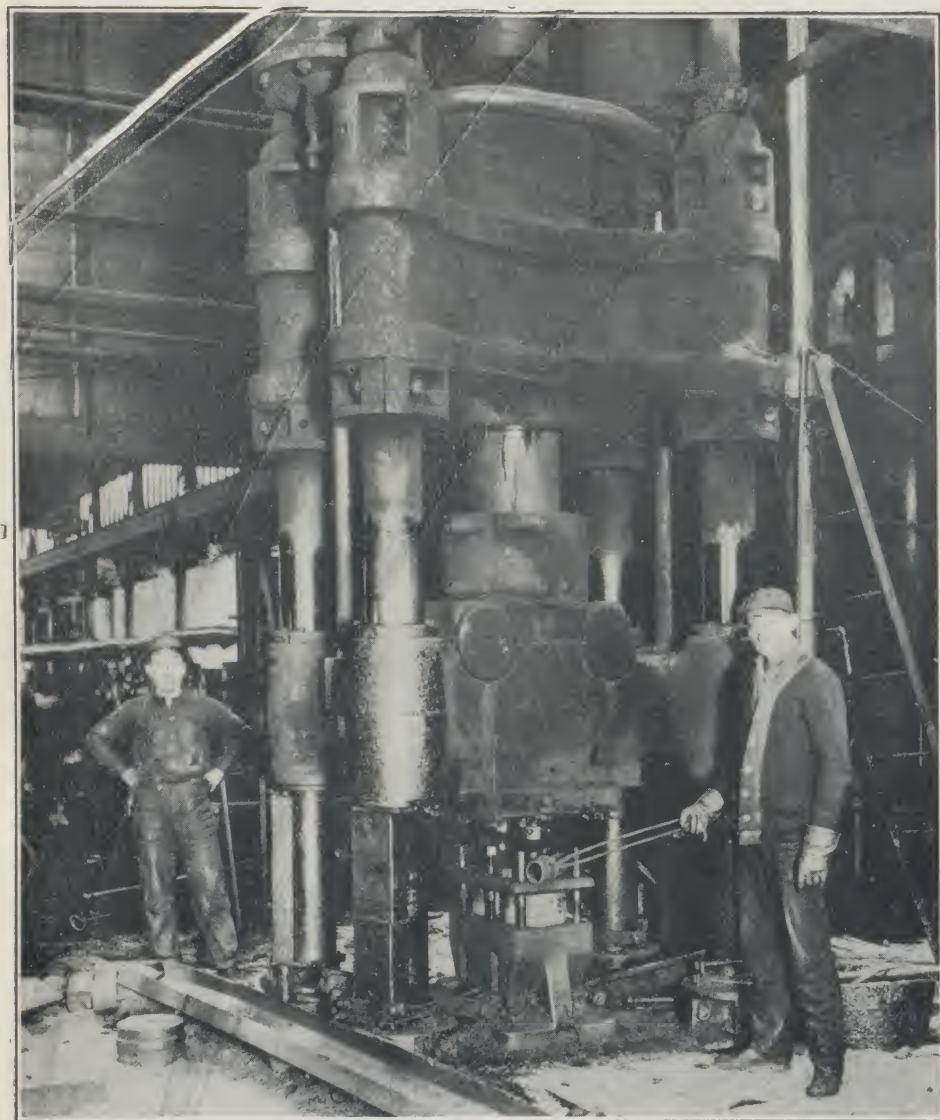
from three hundred platforms by respective leaders, and perhaps it is not mis-stating the fact to say that the average elector became "fed up." Mr. Meighen had a studied purpose in making the campaign of inordinate length. He wished to "educate" the electorate; in the task he overdid both himself and the cause. The people listened with attention and respect, but after weighing the arguments registered a strong dissenting judgment. In a democracy the majority rules, and the calm acquiescence with which electoral reverses are bowed to by defeated ministries is one of the pleasant and hopeful things of public life.

It is an irony of our political system that interest in politics is too much restricted to a limited period. There is little of such a thing as a live pub-

lic sentiment between elections. The average elector bestirs himself on and for a considerable time before voting day; then he is wont to go back to his vocation, to leave Government and Opposition to Parliament, to draw apart almost entirely from the actual theatre of politics to the isolation of an apathetic indifference. It is not a wholesome thing. As someone has remarked, we should not take our politics in one grand "gorge" at intervals of four years. Political indigestion becomes the inevitable result—the blood rushes to the brain, the faculties are paralyzed, reason is often replaced by passion, and serious distempers develop in the body politic. Less heroic doses, more frequently taken, would be better. A closer public scrutiny of their doings and deliberations would make Parliament and the Government responsible to it more cautious and conservative and receptive to new ideas.



A view of Guelph, Ontario, showing post office and other public buildings.
Photograph, courtesy Grand Trunk Railway



One of the smaller hydraulic presses, in the forge department of the British Empire Steel Corporation, New Glasgow, N.S.

In the face of a political upheaval so marked as that which we have just experienced, the question may reasonably be asked as to the underlying causes. It is perhaps dangerous for the non-partizan to attempt a too-close autopsy of the political *corpus delecti*. No one is more sensitive than the party politician or more prone to attribute animus to the most unprejudiced exponent of an independent view. Obviously, however, an effect so sweeping could not have been produced without some engrossing cause. Let it be said that the fault did not lie in any lack of energy of Mr. Meighen in carrying forward his fiery cross. He is the personification of a political fighter, liking nothing better than the thick of every fray. He enters a political campaign, or a parliamentary duel with an ebullient joy that is youthful in its enthusiasm. He loves to

take a shot at every alley, a verbal crack at every head that rises in his path. He spoke from a hundred and fifty platforms and he told much the same story, everywhere in that brilliant, dramatic, assertive, style that those who know him are accustomed to. He preached the doctrine of protection with an almost evangelical fervor in the protectionist East, he championed the same cause in the unsympathetic atmosphere of the West. Let us concede him, by all means, the merits of consistency.

One great trouble with Mr. Meighen—but not the only one—appears to be that he was the specific legatee to a badly encumbered estate. Union government was an acceptable institution in the time of war and performed a function whose efficiency, in a particular period, was doubtless increased by this alliance. But, in the light of all that has happened,

it appears to have overstayed its mandate. It hung on after the war, despite the fact that not a few of the Ministers, viewing it as a war government exclusively, resigned and quit. When Sir Robert Borden stepped down and out and Mr. Meighen was the overwhelming choice of the parliamentary party as his successor, it was decided—unanimously, as his party now concedes—to perpetuate the fiction of Unionism. The name National Liberal and Conservative Party was chosen to reflect this view, and it was a contributory handicap to the new Premier. It alienated or rather reduced to a condition of sterility, a certain element of the Party who favored an undisguised return to the old lines, while the recent election results would appear to indicate that no very substantial party of the Liberal electorate were retained in their war-time allegiance. Mr. Meighen assumed the halos and honors of his predecessors, but, likewise, he inherited that train of tribulation that comes after almost every war-time administration throughout the world. Part of this condition was engendered by objections to the administration of the Union Government; perhaps, to a greater degree, it was a psychological condition reflective of a universal unrest. Whatever they thought at the time, and however submissive or enthusiastic they were to the idea of "carrying on," the great preponderance of the former parliamentary party to-day subscribe to the view that it was a mistake to revive or perpetuate the Union idea. The revival was not a success. In the opinion of most of his party, it were better had Mr. Meighen made a clean sweep and a fresh start instead of endeavoring to sustain a coalition with but the remnants of statesmanship. The Conservative Party would have fared better had Unionism been dissolved with, or soon after, the declaration of peace. When, for reasons which are readily explainable (his long enforced absence at the Peace Conference, for example), Sir Robert Borden did not follow that course, many of his party now regard it as a thousand pities that Mr. Meighen did not do so when assuming office in July of 1920 or soon after. He went ahead on the old lines till last Autumn when he reorganized his Cabinet in a way largely suggestive of the old order. It was too late. There followed the campaign of extraordinary length above noted. Unfortunately for Mr. Meighen and his Ministry the pilgrimage to the country has

led, not to the renewed ascent of Olympus, but down to the suburbs of the Valley of the Shadow.

A new Government comes into office and, of course, a new Parliament. The distinctive feature, apart from the change of government, is the advent, in great numbers, of what is commonly known as the Agrarian Party, though they have broadened into the more pretentious appellation of Progressives. At this writing, there appears to be doubt whether they will play their part single-handed or, in a somewhat subordinate sense, perform a co-operative or coalescent part with the new Government. In any event their numbers are great. Significance cannot fail to attach to a movement which, from the first crack out of the box, registers a score of sixty-five and thus surpasses in numerical strength the Conservative Party, with all its wealth of tradition in the national life of the country. The apparition is very great: its potential strength is not to be discounted; the balance it is capable of exercising may be viewed by many as almost ominous. Whither we are drifting, what new policies will eventuate from the new conditions, what radical reforms may or may not be enacted; to what further extent party lines may be submerged in the interest, or at least the supposed interest of National government, are things now enveloped in the nebulae. As Mr. Asquith would say, we must wait and see.

In any event, the election is over. The tumult and shouting have died; many of the political captains and kings have departed, some to the reserve list, so to speak, others to a long rest in political obscurity. A new ministry and a new orientation generally, takes hold, headed by Mackenzie King, leader of the Liberal Party, heir to the mantle of Laurier. Mr. King, though a young man, has long been gunning for the game he bagged. He is perhaps the first Canadian Prime Minister who started out in life with the deliberate purpose of pursuing a political career. He may have aspired from the first for the Premiership; I rather suspect he did. He has met his rebuffs and adversities; he has encountered the tidal currents common to politics; he has gone down and come up. Now he climbs the bank to the highest office in the gift of his countrymen. It is a noteworthy thing that in the person, first of Mr. Meighen, now of Mr. King, the young men come into their own. Happily, we have outgrown the stage where comparatively old age was a primary

qualification for the premiership. The vigor of youth is about as desirable an element in government as maturity in judgment. Mr. King should not be prejudged. Some may not have liked him in Opposition; let us see what he will do in the Government. Parliament and the country alike will be fully disposed to give him a chance and to make a generous allowance for the fact that he enters upon his career in a peculiarly critical time, whose concerns no one can view with untroubled equanimity.

National problems are great and burdensome. We have to carry a public debt of about two and a half billions; we have the engrossing prob-

lem of the National Railways, producing an annual deficit of some seventy millions, while a band of patriots in Ontario and the West cry out against any unholy hands being laid upon the fabric of national ownership. They would cling to it even if the country went over the precipice of national bankruptcy. It is a serious condition, yet one which, under existing circumstances, should be attacked solely on its merits and without regard to the political prejudices and complexion of the House. We have the tariff, whose revision has long been overdue. Is protection to be perpetuated, or is the middle course to be followed? If

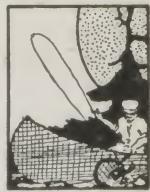
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Photograph, courtesy Canadian Pacific Railway
St. James Street, Montreal, the "Wall Street" of Canada, showing in the foreground Canada's oldest banking institution, the Bank of Montreal



ON LAKE AND STREAM IN CANADA



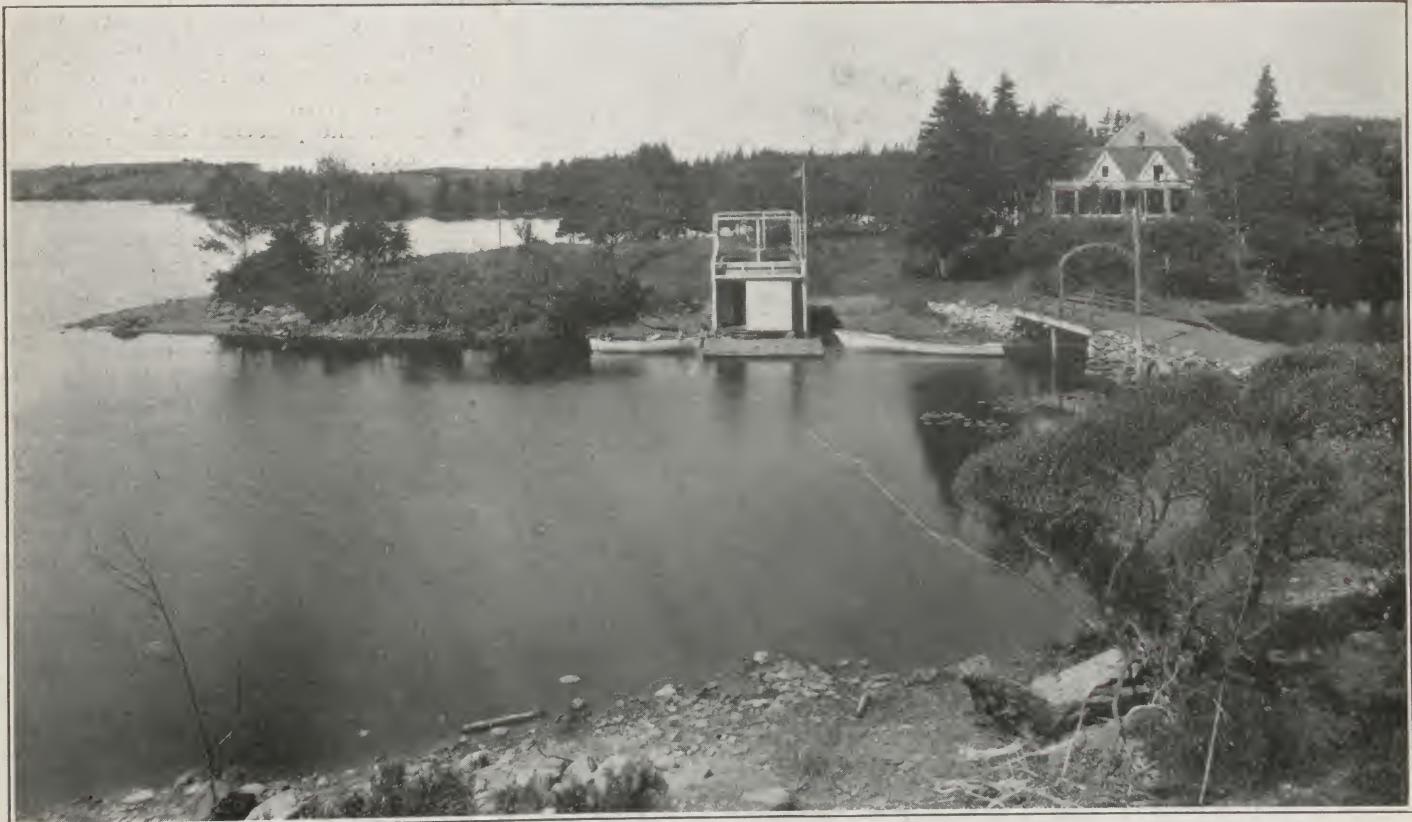
Something About The Wall-Eyed Pike-Perch

THE wall-eyed pike-perch is one of the notable freshwater fishes found inhabiting the waters of Eastern Canada, and in the same breath it may be said that it takes rank as one of the most important food fishes, in a commercial sense, allied to Northern waters. That a great deal of mystery has surrounded this fish, its proper place in finny history, its habits and distribution is only too true, and it is for this very reason that an appraisal of it in print considering all these and many other points of interest in regard to it will be eagerly perused by Canadian

By Robert Page Lincoln

anglers. Among the many letters from Northerners that I have received asking about this fish was a communication to which was attached a photograph showing a string of fish which the writer designated as "pickerel," but he made bold to announce that he was not so certain that they really were pickerel because while they looked like pickerel still they did not answer in body structure, scales, eyes and fins to any pickerel he had ever seen. But because all the anglers

in his vicinity knew them and called them pickerel he did likewise; but he wanted to know the truth of the matter; just what sort of a fish it was and more about it than he knew anything about. A glimpse at the snapshot proved the string of fish to be a handsome array of wall-eyed pike-perch; as fine a string, by the way, as I have ever laid eyes on. The largest one was an eight-pounder and the smallest one, the letter stated, was an active fellow of four pounds. Now, as anyone knows who is at all cognizant of the pike-perch topic, that catch was fit for the pastime of a king; and



Photograph, courtesy Canadian Pacific Railway

The public picnic grounds of Weymouth, Nova Scotia



Canadian waters produce Bass and Great Northern Pike in abundance. This is an unusually good catch

table fare of a sort that would tickle the heart of a Pepys. For be it noted that there is hardly a fish that is equal to the pike-perch as a food. In this respect it is practically identical with the yellow or banded perch, which has previously been considered. All members of the perch family are panfish that are more than worthy of the name. And while the yellow or banded perch is a delight and a sensation, the wall-eyed pike-perch, taken from the cold waters of Northern streams and lakes, by far takes the lead.

The wall-eyed "pike" (as it is generally called) belongs to the perch family, of which there are upwards of a hundred species recognized throughout the world, the principal ones

located on the North American continent being the wall-eyed pike, the sauger and the yellow or banded perch. The wall-eyed "pike" should not be confused with what is known as the sand-pike, or sauger, which is found generally throughout the Great Lakes region. The sauger (*Sitostedion canadense*) is much smaller than the wall-eyed "pike," more slim, and not by any matter of means so symmetrical as to body structure. It does not attain to a large size and a four or five-pound specimen may be considered the maximum; while the wall-eyed "pike" often attain to fifteen or more pounds. I have actually heard of wall-eyed "pike" caught by commercial fishermen in the North

that have scaled close on twenty pounds, but this is an exceedingly rare occurrence, a case in a hundred thousand or a million if you will.

It is a common occurrence everywhere to give a fish many names. Every region it seems has some new name for a fish species or variety. The wall-eyed pike finds itself in the same position. Some of the names it is known by are: Glass-Eye, Perch, Pike-Perch, Salmon, Salmon Perch, Jack-Pike, Sauger Pike, Pickerel, Pike and many others. As a rule, it is mistaken for a member of the pike family merely because it has been called a wall-eyed "pike." The wall-eyed "pike" does not belong to the pike family, but is a perch; it belongs to the *Percidae*, the order of spiny-rayed fishes.

Since the wall-eyed "pike" or wall-eyed perch is mistaken for a pike or a pickerel, let us note the difference between them. In the order of the pike are gathered three species, the common Pike, the Pickerel and the Muscallonge. All of the pikes, pickerel and muscallonge have bodies that are covered with a slippery slime, some of them fairly dripping with it. The object of this slime is to prevent parasites attaching themselves to the body; and it will be noted in this respect that if the slime is rubbed free from the body of one of the pikes, or scales are removed, parasites will eventually fasten at that point; fungus diseases also appear, and the fish is doomed. With a covering of slime, however, the parasites are kept at a distance.

The wall-eyed perch (as we shall now call it) is absolutely free from a slime covering. This alone should serve as a means of identification as between it and the various pikes. Where the pikes have soft scales protected by slime, the wall-eyed perch has stiff, tenacious scales close set all over the body, very rough to the touch as fingers are brushed over its sides. Naturally the reason that the wall-eyed perch has been given the name of "pike" is that it has somewhat the shape of a pike. But here it will be noted that whereas the pickerel and pike have but one dorsal (back) fin, the wall-eyed perch have two, the forward one on the back being set with sharp rays, or spines, which when erect are liable to puncture the hands of the angler as he handles it. Another singular characteristic with the wall-eyed perch is the fact that its eyes turn white after it is removed from the water; as white, in fact, as though stone-frozen. No other fish is known to partake of this



Here is a shelter tent particularly well adapted to the climate of Northern Canada

singular condition and it alone should distinguish the fish one from another. It is probably by reason of this that it has been given the name "wall-eye," although I cannot say that I have ever tracked down the origin of it. The condition of its eyes turning white upon capture is most assuredly the reason—the *one* reason, in fact.

It is highly probable that the last large-sized wall-eyed perch are now being captured and now are identified with the waters of the Great Lakes and the region adjacent, such streams and lakes in close proximity to these great fresh water depositories which it is known to be native to. The Great Lakes may positively be said to be its native home. It is probable that it originated there and from this common home ascended streams and so covered all the waters of its present range. In later years, of course, this range of distribution was increased through plantings in various waters. But as to its home, it may be said that originally it was found in the waters of the Great Lakes. At certain times in the summer, great schools of these wall-eyes leave the Great Lake waters and move up the inland rivers, at which time the fishing for them is of the very best. These excursions of the perch up the rivers and streams, great and small, are in the interest of gaining food, and it may be said that if such a school is located in the rivers any sort of a lure will contrive its capture. It is then, too, that it can be angled for with the fly-rod, using a large sized bass-fly with probably a glittering gold or silver spinner used in collaboration with it.

As previously stated, the wall-eyed perch ranges through the country

embracing the Great Lakes. In the United States it is not found west of the Mississippi River and in Canada not west of the Province of Manitoba. It is found in the United States as far south as Ohio, and in the east is found in some of the New England States; in New York, New Hampshire and Vermont. I am uncertain as to its distribution in Maine, but it is possible that it is not numerous there. In Canada it holds forth principally in Ontario and the St. Lawrence and is found in somewhat of a profusion in the States of Minnesota, Wisconsin and Michigan.

In some waters wall-eyed perch are captured that are a washed-out green

in color; although some Northern fish of this species turn out singularly rich in color work. The back is generally olive-green, set with wavering marks of a darker color. It is comparatively slim from the centre of its body to the tail, the body being more or less round. The tail is very well formed and is one of the most distinctive parts of the fish. The belly of the fish is of a silvery hue, whitish-silver being the correct way of stating the matter. It has been said that it is by reason of this silvery hue that the wall-eyed perch has been given the name "salmon." Indeed, when captured and it is played to net, the whole fish seems to radiate silver. The head of the wall-eyed perch is shaped a great deal like that of the pike, being long and more or less flat and is bronze-green in coloration and without scales upon it. A notable feature in regard to the head, aside from its rather large eyes, is the fact that its under jaw protrudes beyond the tip of the upper jaw. A notable feature, too, are the fangs in its jaws. These are exceedingly sharp and are found in numbers, proving conclusively the fact that this perch preys upon other fish; in fact, it is every bit of a cannibal and will kill those of its own kind, its own offspring, in fact, when the opportunity permits and such fish are not speedy enough to make their departure. The fangs in the mouth of a pike, pickerel or muscallonge are as nothing compared to the array of teeth found in the mouth of this perch. Other notable features noted in the wall-eyed perch are as one



Photograph by Garnault Agassiz
It is in such British Columbia waters as these that the Steelhead is found at his best

writer has stated them: "The gill covers are not scaled excepting the lower strip which is noticeably scaled and the cheeks are entirely unscaled. There are five rays in the branchios tegals, which is of a salmon-and-silver hue, the underside of the head is of a salmon and silver delicate pink color. The mouth of the fish comes directly under the line of the back part of the eye. The eye is usually large in this species. The eye of a four-and-one-half pound fish measures approximately three-fourths of an inch in diameter and is of a full grey and brown color with a line of golden light separating the pupil. The pupil is jet black and large. This is one of the most conclusive evidences of the fish being classed as a wall-eye, as there is no other species of the pikes or pike-perches that compares in this respect to the fish under discussion."

Like the smaller member of the perch family, *i.e.*, the yellow or banded perch, the wall-eyed perch is a fish that moves about in schools, some of these schools numbering as

high as a hundred members. Another point to be remembered is that it is a bottom-feeder, or, at least, it moves along near to the bottom and the only way to have success in capturing it is to get the lure down at least five feet off of the bottom. Because those who go out for the wall-eyed perch are sometimes bereft of luck in attaining a mess, the reason may be singled out that the lure has not been trolled deep enough; but if the lure is moved along at the level stated, from three to five feet off of the bottom, results will sometimes be startling. And it may be said in line with this that when a school is located and a capture is made it should be played to net as speedily as possible and the boat swung and the same place trolled over again. For once a school is located they will fall in line to be captured one after another until you have obtained all that you possibly desire. But miss the school and you may as well troll in a fishless pond. The idea, therefore, is to locate the places where the perch schools move and then

when one is located, to fish back and forth over it, following it wherever it goes.

It seems passing strange in all the fishing that is done how little is known about the science of the art. And art it surely is. David Starr Jordan has stated that the prime essentials to angling and the especial qualifications of an angler should be his ability to know the fish he is after, its habits, where found, when found, aside from how to get it. The same is true with the wall-eyed perch. The average angler trolls for it close to the surface when he should go down deep; he does not know the "follow the school" system; and another point that should not be lost track of is: he does not know that the wall-eyed perch is nocturnal in its habits. By that it is meant that the wall-eyed perch is a night prowler. Whatever may be said as to the best time of the day for the capture of it, the day hours are scarce equal to those hours bridging on twilight. From twilight or into the night,

Continued on page 60



This is a view of Christina Lake in Southern British Columbia, one of the most popular summer resorts on the international boundary

Photograph by C. M. Campbell

*British & Colonial Press Photograph*

Marshal Foch being officially welcomed to Montreal by Mayor Mederic Martin, preparatory to signing his name in the official visitors book at the Montreal City Library. This book, commonly called the "Gold Book," although it is bound in red morocco, contains the names of many illustrious personages.

*British & Colonial Press Photograph*

Another distinguished recent visitor to Montreal was Earl Beatty, who is here seen about to take the pen from the hands of Mr. Hector Garneau, the Chief City Librarian. The gentleman to the left is Alderman J. J. Creelman, K.C., who represented the city in the absence of Mayor Martin, who was indisposed.



British & Colonial Press Photograph

Lord Byng, Governor General of Canada, unveiled on Armistice Day in Dominion Square, Montreal, a memorial cenotaph to Canada's fallen dead in the Great War
Many wreaths were placed upon it in the course of the day by people representing all classes of the community



British & Colonial Press Photograph

One of the features of the ceremony was the placing of a wreath on the monument by a lady chosen to represent the bereaved mothers



British & Colonial Press Photograph

The St. Patrick's Hockey Team of Toronto, which is contesting this season with the Senators, of Ottawa, the Tigers, of Hamilton, and the Canadiennes, of Montreal, for the professional title of Canada



British & Colonial Press Photograph

In the presence of a distinguished gathering, Dr. Wilfred Laurier McDougald, the new Chairman of the Montreal Harbour Commission, was recently officially installed in office. Dr. McDougald, a young man of large affairs, is regarded as one of Canada's coming public men. From left to right in the group are: Hon. Walter Mitchell, member elect for St. Antoine's Division, Montreal, and former Treasurer of the Province of Quebec; Hon. Senator J. P. B. Casgrain; Dr. McDougald; Hon. G. W. Ross, the retiring Chairman; Brig. Gen. A. E. Labelle, retiring Commissioner; Mr. M. P. Fennell, Secretary; Hon. A. R. McMaster, M.P.

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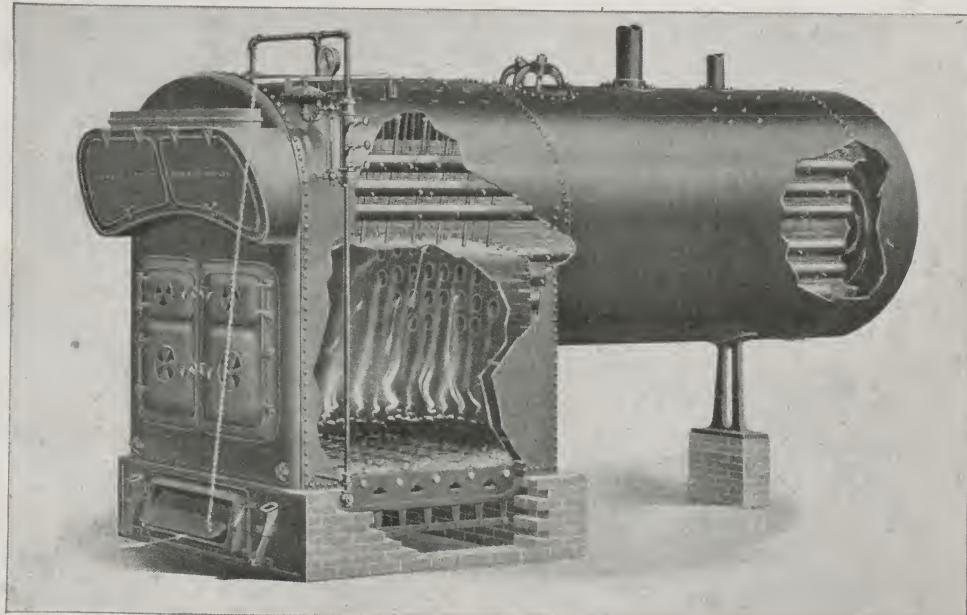
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Ships and Shipping

IN a paper read before the American Society of Civil Engineers, Mr. Frederic H. Fay, a prominent consulting engineer, discussed at length the advantages of Portland, Maine, which, as the winter terminus of the Grand Trunk, is the ocean gateway for a large Canadian foreign commerce.

"Portland," said Mr. Fay, "is a good example of one of the smaller, but important ports whose development has long been neglected, but where public sentiment has been aroused, the needs have been recognized, and the state and the municipality are co-operating toward a modern development of the port. Portland possesses a harbor which, while not comparable with New York in size, is of ample area with a natural deep-water channel and with no bars at its entrance.

"The harbor is well sheltered, in close proximity to the open ocean with a channel so direct that steamships

making regular calls at this port dispense entirely with pilots and enter the harbor at any time of day or night at any season of the year, under the direction of their own officers. From the standpoint of natural advantages, Portland, Maine, stands as one of the best of our American ports.

"Portland is the Atlantic terminus of the Grand Trunk Railway and is the natural winter port for the Dominion of Canada. It is also a terminus of the Boston & Maine and the Maine Central Railroads. Portland is the nearest United States port to the United Kingdom and Europe. That the Federal Government has considered Portland one of the important Atlantic ports is shown by the fact that the harbor has been heavily fortified by the Government. During the war, troops and war supplies were shipped from this port to the full limit of the existing waterfront terminals.

"Up to the present time, the only piers accommodating overseas ship-

ping were those of the Grand Trunk Terminal; and, except for certain other wharves owned mostly by railroads and equipped for handling such bulk freight as coal, china clay and sulphur, the wharves on the waterfront are obsolete and a relic of the days of sailing ships when Portland had extensive trade with the West Indies.

"Recently, however, the need of increased waterfront terminal facilities has been keenly felt at Portland. Certain steamship lines which have sought to establish themselves at this port have been unable to do so on account of the lack of facilities for the accommodation of their ships. Only last winter, the North Atlantic and Western Steamship Company, whose boats engaging in the Atlantic-Pacific coastwise trade had been berthed during the summer at the Grand Trunk piers, found great difficulty in securing accommodation during the winter months when the Grand Trunk ter-



British & Colonial Press Photograph

A portion of the Harbor of Montreal, showing recently constructed two-million-dollar cold storage plant



British & Colonial Press Photograph
Part of the two million dollar order of tank cars obtained in Soviet Russia by the Canadian Car & Foundry Company, Limited, as the result of the European trip of Mr. W. W. Butler, president of the Company, being conveyed to the docks over the Belt railway

minal is usually used to capacity, and only succeeded in placing a few boats at one of the Grand Trunk piers through special arrangement with that road and because the Grand Trunk Company's business last winter was not at a maximum.

"Through the instigation of the Portland Chamber of Commerce, an agitation was begun which has resulted in the starting of further development at Portland through co-operation of city and state. The city has just provided the site of the first of a series of publicly-owned piers and the state is now about to construct such a pier alongside the Grand Trunk terminal. Portland, unlike many other ports, already possesses a belt line railroad connecting all of the railroads entering the city, and the new state pier is so located on this belt line that freight at the pier will be handled on equal terms to and from all railroads centering at Portland.

"It is believed by the people of Maine that the development of the Port of Portland will stimulate the industrial and agricultural development of the entire state, especially as the state has available a large amount of undeveloped water power which in these days of high priced coal may now be economically utilized to provide cheap power for industrial uses.

"Administration of this new publicly owned terminal whose construction is to be begun this fall, is in the

hands of a board known as the Directors of the Port of Portland. The board is composed of five members, one of whom represents the City of Portland and the others represent the four congressional districts of the state. The people of Maine, and the Directors of the Port of Portland in particular, keenly realize that their

obligations do not end with the provision of adequate, modern, waterfront facilities, but that when these facilities are provided and before their completion, active steps must be taken to sell the port to their community and to the country at large."

□ □ □

According to Lloyd's Register of Shipping, the world's sailing tonnage decreased 852,000 tons between 1914 and 1921. The United States was the only country to register a gain. Nearly 41 per cent. of the total tonnage of sailers is under American registry, though it should be remembered that the figures include a large number of sailing barges. The percentage of sailing vessels to the world's tonnage is now 5 per cent. as compared with 8 per cent. in 1914 and 22 per cent. in 1902.

The following table gives the world's sailing tonnage by countries in 1914 and at the present time:

Countries	1914 Net tons	1921 Gross tons
United States	943,000	1,186,000
France	397,000	353,000
United Kingdom	365,000	252,000
Norway	547,000	213,000
Italy	237,000	183,000
Other	1,197,000	921,000
Total.....	3,686,000	3,128,000

□ □ □

In a report on the commercial situation of China, Mr. H. H. Fox, Commercial Counsellor of the British Legation at Peking, states that, with the



British & Colonial Press Photograph
Loading the cars on one of the Canadian Government Merchant Marine vessels for shipment to Archangel

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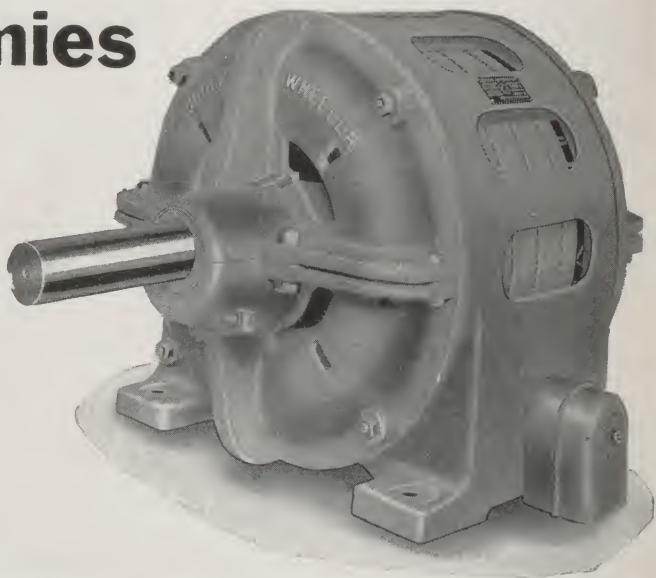
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British & Colonial Press Photograph

A view of the Canadian Vickers Shipbuilding Plant, Montreal, Que.

possible exception of South America, China is at the present time one of the greatest undeveloped markets of the world and is destined in the fulness of time to take a place among the great industrial nations. In spite of internal dissensions and misgovernment, lack of communications and neglect of the scientific development of her vast natural resources, China is making slow but real progress and is on the eve of a period of unexampled commercial and industrial development which will in a few years' time bring about a complete change in her economic situation.

The potential wealth of China is enormous. The standard of living all over the country is rising slowly among the mass of the people, very quickly among the educated moneyed classes. The Chinese have overcome to a large extent their traditional dislike and suspicion of foreigners and foreign ways and are rapidly assimilating Western customs and Western modes of living. Foreign style goods are ceasing to be luxuries and becoming necessities. There are grounds for hoping that for China the worst times have passed.

□ □ □

In his presidential address to the Institute of Marine Engineers, on

November 1, Sir Joseph Maclay, Bart., described the part played by the British mercantile marine in the Great War. He began by saying that the number of ocean-going steamers (over 500 tons gross register) requisitioned by the Government for use as auxiliaries for purely Naval purposes reached its highest point towards the middle of June, 1916, when 1,181 vessels of 3,531,029 gross tons were so employed.

During the actual period of the war and till November, 1920, the actual number of individuals transported to and from all the fighting fronts amounted to 33,340,736.

It is difficult to give a figure for the total quantity of stores moved for the Army, the items being so much mixed up with civil shipments, but taking only the quantity of completed Army stores landed in the theatres of war the figures are:

To the Armistice, 49,000,000 tons weight, equal to 122,000,000 shipping tons; or, if we take up to November, 1920, 56,000,000 tons weight, equal to 140,000,000 shipping tons.

For the movement of horses and other animals, the demand during the war for shipping facilities was enormous. About $2\frac{1}{2}$ millions were carried by sea for Army purposes. Many

of these were for very long voyages, such as to Australia, Mesopotamia, India, Egypt, etc., also from the River Plate to Egypt, France and the United Kingdom, etc., and when the British Army in France was growing daily and obligations in the Near East were being undertaken, 40,000 horses and mules were being brought monthly from the United States of America and River Plate to the United Kingdom. The losses of shipping during the war by submarine and other risks, including only vessels of 500 tons gross and over, totalled 9,943,000.

Concerning the service rendered by British shipping to the Allies Sir Joseph said that in 1918, France had the equivalent of over one million tons gross of British shipping in her services, while forty-three per cent. of her total imports were carried in British ships. Italy had the equivalent of over half a million tons gross of British shipping in her service. About 45 per cent. of her total imports were carried in British ships.

Over 1,000,000 troops were conveyed from the United States in British ships during 1918. The extent of the sacrifice involved will be appreciated when it is realized that 124 additional ships were put into service between March and August, and that on the

average every American soldier carried, shut out two tons of essential cargo. For our other Allies there was also much sacrifice.

In the mercantile marine itself it is estimated that the maximum number of ratings during the war was between 190,000 and 200,000, and that the total number employed during the course of the war was about 300,000. The number of lives lost by enemy action and at sea between August 4, 1914, and December 31, 1918, was 15,629. In addition, 6,331 passengers lost their lives at sea by enemy action.

□ □ □

During August, Sweden's merchant marine decreased by 33,600 tons. At the end of that month its total merchant fleet consisted of 2,816 ships of 1,150,290 tons. The falling off in tonnage is due to the transfer of Swedish tonnage to the German flag.

Up to date ships of 55,000 gross tons have been thus transferred.

□ □ □

President Joseph W. Powell of the Emergency Fleet Corporation states that it is entirely feasible to convert the six American battle cruisers scheduled to be scrapped under Secretary Hughes' naval disarmament program into fast passenger liners. Each is 874 feet long, 101 feet beam, has a mean draft of 31 feet and a displacement of 43,500 tons. They include the Constellation and Ranger, at the Newport News Dry Dock and Shipbuilding Company's plant; the Constitution and the United States, which were to have been built at the Philadelphia Navy Yard; the Lexington, at the Quincy yard of the Bethlehem Company, and the Saratoga, at the Camden plant of the New York Shipbuilding Corporation. The Lexington has been constructed up to the

third deck, or just above the water line.

The cruisers were originally designed to make a speed of 34 knots, and with their great boiler capacity they could attain an economical cruising speed of 26 knots, Mr. Powell said, crossing the Atlantic in five days. The ships, after conversion into liners, might readily accommodate 1,000 first class, 1,000 second class and 2,000 third class passengers.

Mr. Powell does not believe it would be advisable to convert more than three of the vessels into passenger liners because that number would be adequate for the service. No estimate was made by him as to the amount of money necessary for changing the cruisers into passenger vessels, but he said it would be less than the cost of building new liners.

In local shipping circles not much stock is taken in this suggestion of Mr. Powell's. In an interview Mr.



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J. W. Stewart, American representative of Sir Joseph Isherwood, inventor of the Isherwood system of longitudinal framing which was adopted for the battle cruisers, pointed out some of the defects of the Powell plan.

"There are so many practical difficulties to be overcome and the expense of conversion would be so great that the vessels would prove a liability and not an asset," said Mr. Stewart. "As to the cost for making the necessary changes, I would say off-hand that they would be the equivalent of one-half the cost of building the ship. When completed they would be probably the most expensively built and most costly operated commercial passenger ships in the world.

"The battle cruisers are too delicately constructed for the rough handling and continuous service to which they would be subjected as passenger ships. Placed on the seventeen trips a year schedule followed by the fast foreign liners, the constant drive of the engines, coupled with the grinding against piers and other rough usage, would result in time and money being lost for repairs.

"There is the further consideration that the boilers, being of navy design, occupy more space and require more expert handling than is considered economical on passenger ships. In general the design of the under deck compartments, together with the large amount of room taken up by the running gear, means a sacrifice of dead-weight space. The tendency of passenger ship building to-day is all in favor of the vessel which can carry cargo as well as passengers. If it is true that substantial profits can only be shown by ships of this type, then the converted battle cruisers would obviously be unsuited to the conditions of competition that now prevail."

□ □ □

In a statement issued to the German press, Vice-President Ehlers of the North German Lloyd Company states that his line is making rapid progress with the rehabilitation of its fleet. At present the company is employing in the Brazil service the Vegesack and Bremerhaven which were built last year, and has recently repurchased from England its former steamers Westfalen, Holstein, Gotha, Seydlitz, York, Gottingen and Hanover. These steamers are of about 50,000 tons gross.

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On October 1st there was launched for the company the steamer Minden of 4,200 gross tons. She is 360 feet long and has accommodations for 12 cabin passengers. The Minden is a coal burner. In order to be able to compare the different motive powers now in use with regard to their safety and profitableness, the company has ordered two sister ships of equal size, one of which will be fitted with steam turbines and the other with Diesel motors. The largest unit building for the line is the steamer Hindenburg of 35,000 gross tons which is completing at the Schichau Yards in Danzig. She is a sister ship of the Homeric of the White Star Line.

□ □ □

"In order to avail themselves of all the advantages offered by radio it is necessary that shipping men keep well informed on the progress of this science," says Arthur H. Lynch, in *The Nautical Gazette*, New York. "To the operator of vessels, especially of those ships which visit ports where the cable facilities are not the best, the importance of radio should be instantly apparent."

"One of the most forward steps in the development of radio was taken on the afternoon of November 5 when a group of several hundred persons gathered in the power house of the huge radio station about seventy miles from New York owned and operated by the Radio Corporation of America listened to a message from President Harding which marked the official opening of this most modern and complete station. With the throwing of the switch in Washington the station was put into operation and the message from the President was picked up in twenty-eight foreign countries at practically the same instant that it was heard by those in the station which sent it out, and printed verbatim in many newspapers throughout the world within a few hours after it had been transmitted.

"The sending of this message marked a new epoch in radio communication which was beyond the wildest dreams of the scientists of a few years ago. In this connection it is interesting to recall an excerpt from an interview with Guglielmo Marconi published in March, 1897, as follows:

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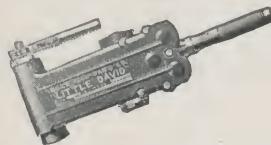
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"And how far do you think a despatch could be sent?" Mr. Marconi was asked.

"Twenty miles," was his reply.

"Why do you limit it to twenty miles?"

"I am speaking within practical limits, and thinking of the transmitter and receiver as thus far calculated. The distance depends simply upon the amount of the exciting energy and the dimensions of the two conductors from which the wave proceeds."

"Signor Marconi himself might have regarded as incredulous the prophecy that during his own lifetime he would be able to hear in Italy a message sent from the United States. But science has gone even further than that, for there is not a corner of the globe where the signals from the Radio Central Station cannot be heard."

"It will be some little time before the Radio Central Station is fully completed. The plans call for twelve huge antennae, each made up of six steel towers, 450 feet in height, extending from a central point where the power house is located. These towers extend in all directions in the form of the spokes of a gigantic wheel nearly three miles in diameter. Each of these six towers will comprise a unit and will operate with stations in given parts of the world, but it will be possible to operate two or more of them in unison in order to offset any particular stubborn atmospheric disturbances. The first unit is now complete and in operation, and the second one will be ready in the near future, for the masts are already erected and most of the installation work has been finished in the power plant which will function with this second antennae."

The advantages of radio communication should be very apparent to the business man, although the science has made such rapid strides during the past few years that it is impossible for those not directly connected with it to keep pace with all the developments. Even though there is good cable communication to most of the important sections of the world, there are still many places where the delivery of cable messages takes a great deal of time and costs a lot of money. The installation of a cable from one point to another, where the distance is at

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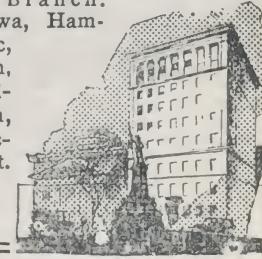
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all great, is a very expensive undertaking, and such a cable will only afford communication between the two points. With radio, however, a transmitting station designed to send messages a distance of one thousand miles will reach any point within that radius."

★ ★

Handling the Canadian Grain Crop

Continued from page 9

the St. Lawrence Flour Mills Co., Ltd., Montreal; the Western Canada Flour Mills Co., Ltd., Winnipeg; and the Robin Hood Flour Mills Co., Moose Jaw. These companies have mills of large capacity situated at strategic points throughout the wheat belt and at tidewater, particularly Montreal, where are located some of the largest mills in the Dominion.

The dawn of a new era faces Canada, and in no one regard does she promise to prosper more largely than in agricultural development. The world is land-hungry, and we shall see an immigration into the Dominion such as she has never known. This will mean greater grain crops than ever before. Just as the wheat farmer drove the ranger gradually back, so the small farmer will displace the big planter with his one-crop system. Manitoba and the more settled portions of Alberta and Saskatchewan will become new Iowas, with a system of crop diversification that will enrich the country beyond the realm of computation.

★ ★

Up the St. Lawrence with Immigrants

Continued from page 13

the way over at the prospect of meeting the husband she married during the war, and one naturally wonders what kind of a sense of duty induced her to book a passage at all. Truly the war was responsible for more than the tragedies of France and Belgium, and we are still in the aftermath.

There was the passenger who had been in Canada before and wanted all others to know about it. His description of Quebec, the construction of

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the ramparts, the assault on the citadel, was glorified guide-book with that egoistical touch which suggests that the narrator was intimately involved in these stirring events. Buttonholing some poor unfortunate he would expatriate at length until the victim, his sense of politeness taxed to the uttermost, would forcibly tear himself away, leaving the discorso to pounce upon some other unoccupied wretch to listen to his diatribe, which he would do immediately without the slightest embarrassment and apparently impervious to rebuffs.

There was the dear old Scottish lady on the way back to her Alberta ranch after touring Europe with her husband and daughter. She was unfeignedly delighted at the prospect of the bald-headed prairie, the smell of the sagebrush, and the manifold duties of a ranch household. One is, however, rather surprised to learn that her daughter is just as delighted to be going back and counting the days until she is again astride her cayuse, after having had all that Europe could offer and being quite a social success. One perhaps finds it difficult to understand the longing in face of all these opportunities for which most girls would sacrifice anything, until one sees the girl herself, tall, stalwart, clear-eyed with that gleam which visioning long prairie prospects always imparts. Though she might grace assemblies in any country she is clearly a daughter of the West, her heart and love in its soil, not to be wooed away.

Bachelor homesteaders would be sent into rapturous transports could they see the host of unattached girls on board. Country girls with the roses in their cheeks; county girls, fresh and athletic; girls who confess they have never left London in their lives before—another glorious contribution to the Dominion, future mothers of generations of Canadians.

On the lower deck the foreign element congregates—of so many nationalities that one hesitates to analyse or enumerate them. They are a happy care-free throng, adding a quaint touch of color to the ship's sombre tints with their bright shawls and gowns. Gaily they go through their national games or perform their folk dances to the music of accordion or mouth-organ. There are foreigners and foreigners amongst our immigrants, and many, in criticizing broadly this element of our immigration tide, have no knowledge of the many ex-

cellent colonies of European peoples in Western Canada and the national bulwark they have at times proved.

And all the while the beautiful wooded, village-dotted banks of the St. Lawrence seem to come closer and closer together as the good ship makes progress up the river. Passengers rush from one side of the vessel to the other as some quaint old French-Canadian hamlet is hailed. They cannot but enthuse over Quebec; Three Rivers unfortunately greets the newcomer with the nauseous blasts from its pulp mills; but the countless little settlements perched high up on the banks are each one a gem. It is all new, strange, and wonderful to these people who are to make new homes in this great land, and to whom the first views and impressions mean so much because they are so lasting. Old world meets the new upon the liner; it is the period of transition, the first step of assimilation.

Somehow one would expect the immigrant, torn up by the root from his old environment, separated from all old friends and the associations he has held dearest, for the time homeless and the future, to an extent at least, uncertain, to be of a somewhat perturbed and unsettled state of mind, attended by a certain amount of worry and distress. Nothing is further from fact—at least no such feeling is evident. On the surface he or she is all enjoyment and buoyancy, bent on getting the most out of life and permitting the future to take care of itself. And it persists up to the last day, in the bustle of cabins being cleared and baggage piled in passageways. There is nearly always a dance held on the last night to be spent on the vessel unless it happens to be a Sunday, and certainly none would suspect from their care-free demeanor and absolute abandon that on the morrow these dancers will embark on a life totally strange to them, fraught with uncertainty, and accompanied by a certain amount of hardship.

In the morning they awaken with that thrill of expectation which anticipated events instill into the subconscious mind, in an atmosphere of bustle and noise, of creaking ropes and whirling machinery, of the shouts of sailors and stevedores. They go on deck to see before them the tall grain elevators backed by the stately spires of Montreal. Laden with baggage, in the echo of farewells and hasty promises, they move down the gang plank, in the same



buoyant manner, the same sporting spirit which will see them through the game. Nearly have they arrived at their goal. For the course of a day they will add a deeper old world touch to the cosmopolitanism of the Canadian metropolis, and in the evening depart for the West to be distributed over the Dominion's broad expanse and their identity as immigrants soon lost.

★ ★

The Lady Cynthia Walks

Continued from page 16

Lord Margrayne had an agonized moment of dread, as, leaving dead Darkell in its tracks, he reached the spot where he heard canine jaws snap with a sound of rending raiment.

With a cry, inarticulate in rage and horror, the young man drove down his rapier between the dog's eyes, then caught the crumpled figure in blue brocade in his arms.

Olivia had fainted, and in his first dread Margrayne mistook the hound's blood for hers.

"Olivia!" he cried, "my little Mistress Ghost." He pressed his lips to hers as though his fierce vitality would bring back hers.

It was at this moment that Ann and her brother entered the gallery.

Possibly the bona-fide ghost of poor Lady Cynthia would have been better welcomed than the sight they saw.

Ann came near to hysterics in her rage.

Sir George, seeing his dead favorites, cursed.

Lord Margrayne paid no more heed to host or hostess than if they had been absent.

He had seen Olivia's brown eyes open.

"You are not hurt, sweet?" he cried. She sighed.

"Oh, if you had been killed!" she moaned.

Ann's voice broke harsh and scolding.

"Bag and baggage you shall begone from here, you hussy. Bag and baggage before dawning. The viper! The toad! And stealing family heirlooms! The law——"

Lord Margrayne checked the tirade. But he spoke to his host.

"Sir George," said he, "this lady is my promised wife. You will no doubt

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entreat your sister to use discretion with her tongue or I hold you responsible. My sword, sir, is at your service. For the rest, if law be mentioned, I should ask for judgment against a cur who came near to being dubbed murderer for loosing hours on a helpless girl. Now, if you will summon my servant I will give orders for an immediate departure, though since I came on horseback I must insist on your hospitality for this lady till my mother comes in her coach to fetch her hence."

'Twas a long speech, but it cooled Ann's hysteria and Sir George's temper.

For once the Black Backrane had met their match, though you may guess what Ann at least felt at sight of her coveted lordship bidding tender farewell to that brown-eyed slut!

But she did not call Lord Margayne's future wife that name alcud!

As for Toby and Prue, their grief was loud and strenuous when they heard their dear comrade was going.

"You prom—prom—promised to snowball in the orchard," sobbed Prue.

"And Hal prom—prom—promised to spend Christmas here," moaned Toby.

But Olivia smiled radiantly, as, folding them in her arms, she vowed they should come and stay with her as long as they wished and play snowballing all day, too!

Then a horn blew, a coach drove up, and away went Olivia from bondage.

In those days the chairs of matrimony were not named that!

So Olivia rode to happiness.

Ard—why! you'll not ask for a tedious sequel? So I'll leave you with a Christmas scene of our audacious Livy standing a-tip-toe to fix a holly wreath about an ancestral picture, and a handsome lover stealing behind to claim the Christmas kiss of peace and good will.

Olivia smiled.

"Poor Lady Cynthia," said she inconsequently, "I vow I—I hate all ghost tales."

"And I," quoth Hal, "love one sweet ghost."

Then—he took that kiss.

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The Badlands of Alberta

Continued from page 25

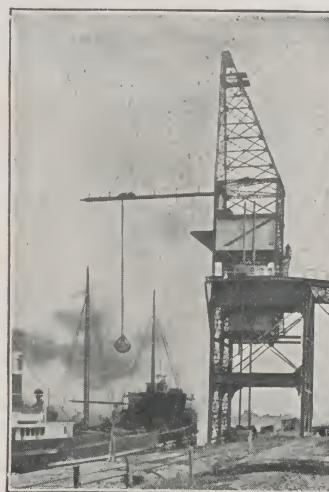
Steveville, which, lying on a high river flat, looks up and down the Red Deer. From Iddesleigh, Jenner or Patricia, farther down the line eastwards, the still larger Badlands on Sand Creek may be reached by a short journey of some eight miles. From the older village of Steveville, where good accommodation can be obtained, a walk of Circa one half mile will take one into these canons and buttes. The vegetation bears a strong desert character similar to that of the American southwest.

The scenic effect of these domes and towers of white and white and brown or black and purple banded rocks, is very startling and ever-changing. Travelling up a canon from its open flat mouth near the river the walls are massive and usually very high and steep. A dry creek bed (a roaring torrent of liquid mud during a rain) twists through ever narrowing grassy and sage covered flats; after a mile or two steep and narrow tributary canons appear, and the walls approach. The upper heights change from large blocky towers and mesas to pinnacles and sharp saw-backed buttes with quite accessible slopes, and eventually one is faced by two or three forks, which are often almost too rough and narrow for foot work, at least with any comfort. On top again, one will find a plateau surrounded and dotted by buttes of very various shapes and sizes but mostly more or less conical. Upon crossing this small or large tableland there is repeated the small gulches with their towers, pinnacles and ranges, and rapidly another canon develops. Although heading in a totally different direction one may find that this second canon joins the first in a maze of buttes and tributaries perhaps not more than one mile from the former, and both may unite to feed a wider and larger watercourse. Although the white and most fossiliferous rocks are called sandstones, in contradistinction to the green and brown clays and shales intercalated with them, they still contain a considerable amount of clay and are quite impervious to rainfall, a sharp shower of fifteen minutes duration will bring

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down a foaming flood of chocolate colored water, and the hills themselves then become very treacherous underfoot being greasy and slippery though perfectly dusty at a depth inwards of a quarter of an inch.

The views that this scenery can produce at night with a large moon and some clouds, or by electric storm, are very beautiful. I well remember one evening in January, whilst in Eo-ceratops camp, the ground and buttes being buried in snow on lesser slopes, and the moon being full, when in spite of a temperature of 20 degrees below, I watched the moonlight approaching, standing outside my tent. It was very dark, and heavy black clouds were in small patches, the buttes across from my camp were very serrate and deeply scored and gradually they appeared in ebony and white against a pale glow, giving an impression that one had been transported to the scenery of that moon itself. As the light increased, further buttes and canons showed, with such black penumbra in the spaces between, that chaos was the closest expression I could give to the scene. Under the black cloud-banks all was veiled in a semi-obscure mysteriousness, but before the moon showed itself the edges of the buttes became clear cut in white and pearl, and I was only drawn to the fact that I was freezing by the bark of a coyote.

One summer's evening in June, at Steveville village during a long drought, a heavy thunderstorm seemed approaching, and I remembered that I had neglected to cover a small bag of plaster of paris, which was then scarce, so although already 9 o'clock I undertook to jog down through the Badlands some two miles on a fair cattle trail and rescue it from the possible though improbable deluge. I arrived in good order, though warm—the Badlands can be very sultry—and rescued the precious gypsum. More than half of the return journey was accomplished, when just where the trail debouched sideways to avoid a canon head, the darkness fell, the thunderstorm commenced and I lost the trail. Fortunately, the flashes were very frequent and vivid, and after falling flat into a shallow canon, a flash arrested my steps on the edge of a large precipice, and I saw the trail winding under the blue flickering but with a regular steeplechase

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of obstacles between myself and it. The buttes in the blinding light shone out of the surrounding blackness like large wet monsters, and it was certainly worth getting lost to observe this scene from its own grounds. The very waves on the river and the ironstone blocks on the peaks showed as clearly as by photograph. All in all, these regions are very well worth visiting by those who love to test all the different sides and moods of Nature; they are not picnic grounds but bring thoughts to one whilst walking over the heaps of bone of some reptile giant who lorded it before Alberta was a Province.

★ ★

Notes from the Canadian Capital

Continued from page 29

platforms count for anything, some revision will need to be made and that revision will be downward, with its degree contingent upon the influence which the radical party from the West is capable of exercising with the Government or with Parliament. Ward up with this is the whole question of internal and external trade and the development of the great latent resources of the Dominion. In the broader political aspect, there looms up the question of external relations, and whether we shall elect to go ahead on the old lines or to assert that constitutional independence with the Empire, which, as is claimed, has come to us as a natural consequence of our war effort.

The situation admittedly is great and complexing, and doubtless Mr. Fielding spoke from the heart when, on the morrow of the victory, he declared that a government these days "is entitled to sympathy and congratulations." After the smoke of battle has cleared away and public passion has subsided and we return to normal activities, the hope that probably is most predominant is that there will be stability of government, not halting uncertainty, a vigorously intelligent attack upon our ponderous problems leading to their successful solution and an ultimate return to that fuller prosperity we once knew. That we departed from it is not, broadly, the fault of government but rather of that world-wide exhaustion and reaction which are

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the patrimony of war. The readjustment process is under way. Let us hope that a new Parliament will hasten the day of its final and happy achievement.

★ ★

Something About The Wall-Eyed Pike-Perch

Continued from page 34

the wall-eyed perch are on the go. This is especially true in the summer months, especially August and July, when they appear very indolent during the day but as night comes on they turn to feeding. In the deepening dusk of evening, if you are fishing for them in the rivers and streams, a pure white artificial minnow cast off of the sandbars is almost sure to win captures. Personally, as regards an artificial minnow that is better than any other for the work in view, I state it as my belief that that artificial is of the so-called wobbler type. A wobbler minnow when reeled or trolled through the water dips and dives and in this manner perfectly imitates a struggling or drowning fish, and the perch are speedily there to seize it. However, most wobbler minnows are light and are used for surface fishing. If one will, therefore, attach to the line up ahead of the minnow a sinker to bring it down closer to the bottom, so much the better. On particularly moon-lit nights I have caught numbers of wall-eyed perch off of river sand-bars as late as ten o'clock at night, using the so-called glowing minnows, or wooden minnows, which are treated with a phosphorescent preparation. This ghostly glow in the waters serves to attract in many of the fish in question.

It has been thought by some that the "high time" in the year for catching this beautiful Northern fish is during the summer. This, however, is not wholly true. The autumnal season by far is the better time to go out for it and from the first frosty nights in September, when the leaves on the trees are turning yellow and golden, to the time the snow is flying in December, the wall-eyes are striking in fine style. I have captured them when it was so cold that ice was beginning to edge the lakes and when the wet line would freeze as soon as

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drawn from the water. There may be a time in the year when, as a panfish the wall-eye cannot be equalled. That time is no doubt in late autumn. The flesh of the wall-eyed perch is flaky—that is to say the flesh comes apart in layers. It is to be admitted though that in warmed-out waters in more southern districts of its habitat the flesh is very soft in the summer. A wall-eyed perch, however, brought in from cold water is a table dainty the year around.

The wall-eyed perch spawns either during May or the early part of June, it all depending upon the state of the weather. If the temperature is agreeable, the perch will be through spawning by the 10th of June, or at the latest the 15th of June. Being a fish inclined to live in waters that have a pebbly bottom, the wall-eyes seek out the shoals, the bars and pebbly shallows and there cast their eggs. As previously stated, after they have reared their young they turn around and prey upon them, devouring them as food. Perhaps there is no fish so voracious after spawning as the wall-eyed perch. During the period of bringing forth its young it apparently fasts, hence the hunger that gnaws at its vitals after this time of procreation.

There are wall-eyed perch found in the streams as well as in the lakes. Some prefer to live their life in the stream, and it is these latter specimens that provide the best sport that one can imagine. In the streams they prefer to keep themselves around islands, and where juttings of sand shoot out from island tips. This is especially true in the St. Lawrence. Some of the fishing around these island tips is of a marked order indeed. It is strange that if there is a sandbar to be found in a stream, and wall-eyed perch are noted in those waters, there you will find this active fish. Sandbars and wall-eyed perch go together; one can as well say they are synonymous. Locate sandbars and troll along the edge of it and you are standing in good to acquire a mess in short order.

Mention has been made that artificial minnows, both wobblers and glowing lures, are exceedingly "cat-chy" for the acquirement of this member of the family *Percidae*. But this is by no means to forget that live lures form a centre of attraction that should not be neglected. In this respect live minnows may be

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mentioned. Live minnows of the so-called shiner or chub species are most desirable. They are hooked right back of the dorsal (back) fin and are permitted to swim around. Care should be taken so that the back bone of the fish is not touched in attaching it to the hook as a minnow whose back bone is harmed will soon die. The use of live minnows on the hook is especially deadly in fishing off of sandbars where the water runs down deep in the so-called "step-off" fashion, and in the deepest holes in a lake in the heat of summer, when so many of the fish go down into the cool depths. But the lure must be gotten down deep in fishing the deep holes—as near to the bottom as possible.

White-bellied frogs are also used successfully in the capture of the wall-eyed perch. In this respect it may be said that the frog need not be alive. The use of live frogs on the hook should never be countenanced. The dead frog may be hooked through the nose and when it is worked through the water this action will convey sufficient animation to it to make it appear lifelike. When a wall-eyed perch seizes a live lure such as the frog or the minnow, it does not do so with a violent action such as a pike or a muscallonge is noted for and which, in the case of these two fish, is almost sufficient to jerk the rod out of one's hands. Rather the perch take the lure with merely what could be called a pronounced tug at the line. In some instances this tug is hardly sufficient to let you know that a fish is on. When this tug is felt it is practically certain that the fish has the bait in his mouth. He will then run with the lure holding it in his mouth. This run may be all the way from fifteen to twenty feet. Then he will stop and for the first time will take to turning the lure in his mouth preparatory to swallowing it. It is when this pause occurs that the hook should be set. Of course when one is using spoon-hooks, artificial minnows or artificial flies, the hook is set the moment the fish strikes, for reasons quite obvious.

In using the artificial fly in wall-eyed perch fishing, the best way is to connect to the fly a small spinner of the Number 3 type. This serves two purposes, the foremost purpose being that the glitter is thrown through the water, thus the better calling the attention of the fish to it.

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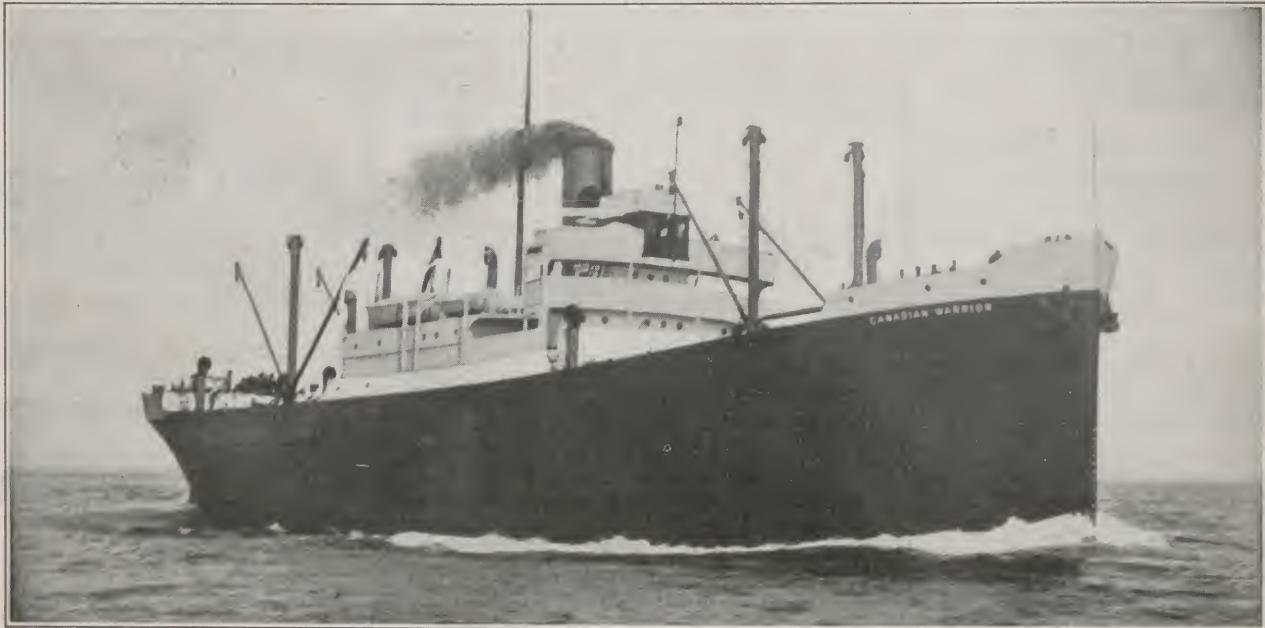
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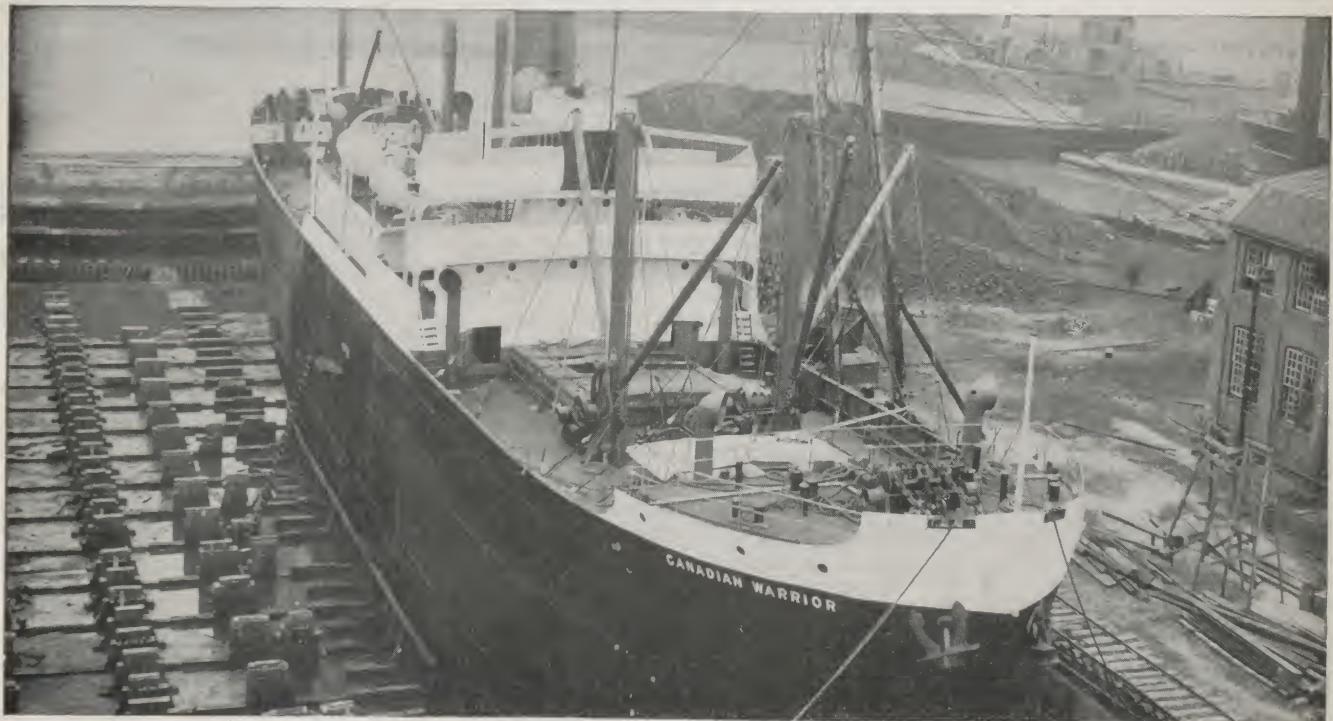
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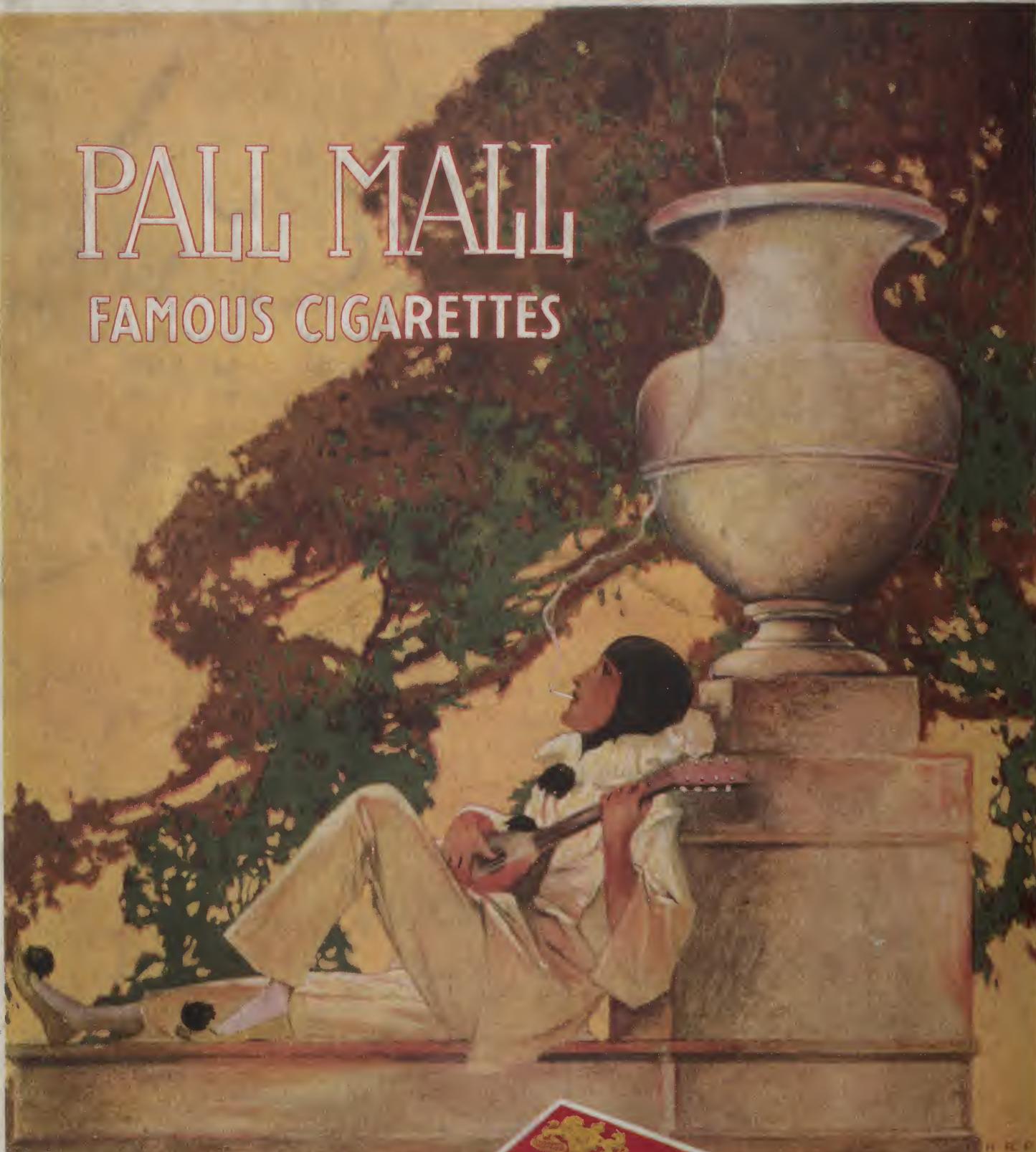
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